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# APPLICATION OF AN AREA-OF-REVIEW (AOR) CONCEPT TO THE EAST TEXAS FIELD AND OTHER SELECTED TEXAS OILFIELDS

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## ABSTRACT

The Underground Injection Control (UIC) regulations of the U.S. Environmental Protection Agency (EPA) require an Area-of-Review (AOR) study for newly drilled or converted Class II injection wells. In Texas, the UIC program is administered by the Texas Railroad Commission.

A Federal Advisory Committee (FAC) formed by the EPA recommended, in 1992, that exceptions to the AOR requirement should be allowed for wells in those areas where a variance has been granted because there is sufficiently low risk of upward fluid migration from the injection zone into an underground source of drinking water.

The FAC listed conditions that could be considered in determining whether to grant a variance. The University of Missouri-Rolla (UMR), under contract with the American Petroleum Institute, then expanded the FAC AOR variance conditions into an AOR variance methodology.

A Department of Energy (DOE) grant to UMR, for which this is the final report, provided for study of the application of the AOR variance methodology to the East Texas field and to other selected Texas oilfields. A final report on the East Texas field portion of the DOE project was submitted by UMR to DOE in 1995. This current final report describes the results of UMR's study of AOR variance opportunities in the Texas Gulf Coast Frio Formation oil producing trend.

In the course of this study, AOR variance opportunities were examined for 73 oilfields in nine Texas Gulf Coast counties. It is believed that the combination of well construction and abandonment characteristics plus the presence of sloughing and squeezing shales and porous and permeable sand sink zones provide for the possibility of AOR variances in 57 of the 73 study fields. The remaining 16 fields are ones where the oil accumulations occur in conjunction with shallow salt domes and where geologic conditions are probably too complex to allow field-wide AOR variances. The successful study results can probably be extended to at least 78 additional oilfields in 17 other Frio Formation producing trend counties.

# 1.0 EXECUTIVE SUMMARY

## 1.1 Background

The Underground Injection Control Regulations promulgated in 1980, under the Safe Drinking Water Act of 1974, require Area-of- Review (AOR) studies be conducted as part of the permitting process for newly drilled or converted Class II injection wells. Existing Class II injection wells operating at the time regulations became effective were excluded from the AOR requirement.

The Area of Review (AOR) is the area surrounding an injection well or wells defined by either the radial distance within which pressure in the injection zone may cause migration of the injection and/or formation fluid into an underground source of drinking water (USDW) or defined by a fixed radius of not less than one-fourth mile. In the method where injection pressure is used to define the AOR radial distance, the AOR is also known as the "zone of endangering influence."

Underground Injection Control (UIC) Program requirements are enforced by the states, where the state has applied for and received primacy from the Environmental Protection Agency (EPA) under Section 1425 of the Safe Drinking Water Act. In Texas, the UIC program is administered by the Texas Railroad Commission (TRRC).

In January 1988, the EPA initiated a Mid-Course Evaluation (MCE) of the adequacy of its regulations for Class II injection wells and, in August 1989, published a report of its findings. As a result of the MCE, EPA's Office of Drinking Water identified areas of concern to be further studied. Among the areas of concern was the need to further evaluate AOR requirements.

In April 1991, the agency proposed and did form a Federal Advisory Committee (FAC) whose charge was to make recommendations to EPA regarding the Class II injection well program. The Committee examined data and information gathered by the EPA during the MCE of the Class II program and, in subsequent studies, identified regulatory gaps and made recommendations for program changes where they were appropriate.

With respect to the AOR requirement, the FAC reached consensus that an exception to this requirement should be allowed for those wells located in areas that have been granted a variance by the Program Director based upon criteria presented in an approved variance plan. Variances could be granted where there is sufficiently low risk of upward fluid migration from the injection zone into underground sources of drinking water.

The Final Document of the FAC lists conditions that could be considered by a Director in determining whether to grant a variance. A variance could be granted based on information indicating any of the following conditions:

- the absence of USDWs,
- the reservoir is underpressured relative to the USDW,
- local geological conditions preclude upward fluid movement that could endanger USDWs, and/or
- other compelling evidence.

The University of Missouri-Rolla (UMR), under contract with the American Petroleum Institute (API), expanded the FAC AOR variance recommendation into an AOR variance methodology that was subsequently revised and adopted by the Underground Injection Practices Foundation of the Ground Water Protection Council.

Five general methods (Figure 2.1) are available for obtaining variance from well-by-well AORs, these are:

1. Variance Based on Absence of USDW
2. Variance Based on Lack of Intersection
3. Variance Based on Negative Flow Potential
4. Variance Based on Mitigating Geological Factors
5. Variance Based on Well Construction and Abandonment Methods

These methods can be used in any order, singly or in combination, to provide variance for some or all wells. Wells not excluded by variance would be subject to conventional AORs.

It is believed that all five of the methods can be applied over large geographic areas but the four methods based upon geologic and hydrologic criteria are most easily visualized as "global" methods. The fifth method requires evaluation of the manner by which the wells in the area under consideration were completed and abandoned.

As part of UMR's contract research for API, the AOR variance methodology was tested by application to the San Juan Basin of New Mexico and the Permian Basin of Texas.

**1.2 Purpose and Scope of DOE Grant**

In the two API sponsored AOR variance studies, the principal data resources were public ones. The first one-year (5/94-5/95) phase of the DOE grant to UMR was for AOR variance study of the East Texas field, where it was anticipated that non-public data would be required, as was the case. Furthermore, it was believed that if an AOR variance could be obtained for the East Texas field, it would be of significant economic benefit to the field's operators, many of which are smaller independent producing companies.

Phase II of this DOE sponsored grant study was for AOR variance study of other Texas counties to be selected in consultation with the TRRC. The purpose of this phase of the grant was to further test and develop the AOR methodology by application to a previously unstudied area or petroleum province in Texas.

1.2.1 East Texas Field Study

The East Texas oil field is located in the extreme eastern part of Texas and comprises approximately 131,000 acres. The field was discovered in 1930 and is the largest oil field in the conterminous United States in the number of wells and volume of oil produced.

Because of pressure declines in the reservoir, the field has been undergoing water injection for pressure maintenance since 1938. As of 1995, a total of 104 Class II salt-water disposal wells, operated by the East Texas Salt Water Disposal Company (SWDC), were returning all produced salt water to the Woodbine sand producing reservoir.

At the suggestion of various East Texas field operators, and with the agreement and encouragement of the SWDC and the TRRC, UMR proposed to DOE a study of AOR variance opportunities for the East Texas field. A Steering Committee recommended that UMR study the variance method based upon the lack of sufficient petroleum reservoir pressure to cause flow into the lowermost USDW. A 1995 report documents the results of UMR's investigation of this variance option.

### 1.2.2 Selection of the Texas Gulf Coast Area for Study

In consultation with the TRRC, the Texas Gulf Coast area was selected because:

1. It has geologic characteristics quite different from any previously studied area and is large and generally geologically similar throughout.
2. There is substantial petroleum production from the area.
3. The Class II injection wells in the area are disposal wells, rather than enhanced recovery wells because the petroleum reservoirs are generally not amenable to waterflooding. Thus, the study would require an approach different than in any previous study.

In selecting the Gulf Coast area for study, it was generally understood that the area would include a band from the coastline inland, probably for several counties, and extending southwest from the Louisiana border to the Mexican border. No more exact definition of the study was adopted because it was expected that such definition would come from the study itself. It was agreed that the study would begin with centrally located Refugio County and would then expand, as appropriate, to additional counties.

## 1.3 The Texas Gulf Coast Study

Selection of the Texas Gulf Coast for study was made in consultation with the TRRC and approved by DOE in late 1994. Some preliminary work began in late 1994 and early 1995. After May, 1995, most grant work was focused on this Phase II effort.

In considering the study, the following concepts were used as starting points.

1. If a variance methodology or methodologies should be found to be applicable, the methodology or methodologies should apply over a large geographic area because of the relatively similar geology that is found throughout much of the Texas Gulf Coast.

2. Groundwater aquifers exist throughout most of the Gulf Coast and the petroleum producing reservoirs are generally either overpressured or normally pressured so that extensive variances based on lack of USDWs or on reservoir underpressuring would be unlikely.

3. Class II wells in the area would probably be disposal wells, rather than waterflood wells. They might or might not be located within oil field boundaries.

4. Based upon experience in the Permian Basin it could be assumed that all wells would be constructed according to TRRC regulations and rules that are protective of usable groundwater and that wells plugged and abandoned after 1967 would probably be abandoned under TRRC regulations and rules that are protective of usable groundwater.

5. Because of the age of some Gulf Coast fields, it was believed likely that some wells, abandoned prior to 1967, would be identified for which TRRC records of abandonment would be incomplete or missing. It was expected that it would be difficult or even impossible to determine if such wells had been abandoned according to TRRC regulations and rules.

6. It was believed likely that sloughing and squeezing shale intervals and permeable sand sink zones would most likely be present to provide mitigating geological circumstances throughout the Gulf Coast. If present, such shales and sand could seal the wellbores and divert upward flowing formation water in the wellbores of any abandoned wells that might be unplugged or improperly plugged, thus providing protection to usable groundwater.

Study of area-wide topics such as geology and hydrogeology was carried out for the entire Gulf Coast simultaneously. Study of individual oil fields began with Refugio County, as a pilot effort, and was then expanded to the other eight counties, including, Brazoria, Chambers, Hardin, Jackson, Nueces, San Patricio, Starr and Victoria.

## 1.3.1 Geology and Hydrogeology of the Texas Gulf Coast

### *1.3.1.1 General Geology*

The Texas Gulf Coast geologic province consists of Mesozoic and Cenozoic, mostly clastic, sedimentary rocks that dip gently (average of about 1°) to the southeast towards the Gulf of Mexico. The nine counties are within a band about 30 to 80 miles wide, containing oilfields with dominantly Frio Formation oil production, that roughly parallels the Texas coastline from Louisiana to Mexico (Figure 2.2). In the subsurface and also paralleling the coastline through the nine county area are a series of major down-to-the-southeast fault zones of which the most important are the Vicksburg and Frio fault trends (Figure 3.1).

As shown in Figure 3.2, this area contains two embayments, the Houston Embayment centered near Houston, Texas, and the Rio Grande Embayment which occurs to the north of the Rio Grande River in south Texas. Parts of both embayments are underlain by salt, and salt domes are present in parts (but not all) of both embayments. Located between the two embayments is a rather poorly defined high area known as the San Marcos Arch.

Oilfields in the central and southern six counties (from northeast to southwest: Jackson, Victoria, Refugio, San Patricio, Nueces and Starr Counties--in the San Marcos Arch and Rio Grande Embayment area) are all associated with major down-to-the-southeast growth fault systems, the largest being the Vicksburg and Frio fault trends (Figure 3.1).

Although major growth faults may penetrate to the land surface in some areas, and although stratigraphic sections are often thin on the upthrown side of the faults, the faults do not seem to significantly affect the thickness of major sloughing and squeezing shale sequences. That is, the AOR procedure described herein is not significantly affected by major growth faults, and the AOR procedure may be used on either side of the Vicksburg or Frio fault trends as long as shale sections are present.

The northern three study counties (from northeast to southwest: Hardin, Chambers and Brazoria) are located in the Houston Embayment or Houston salt basin, and most oilfields in these and adjacent counties are related to salt domes. Shallow domes occur at less than 4,000 feet in the subsurface, intermediate domes occur between 4,000 feet to 10,000 feet, and deep domes are below 10,000 feet.

Although all salt domes are structurally and stratigraphically complicated, intermediate and deep seated domes do not significantly alter the overlying stratigraphic section to the point of disqualification of the AOR procedure described in this report. Shallow salt domes are domes that often bring stratigraphic and structural disturbances to within several hundred feet of the land surface. Shallow domes are a particular problem for the AOR procedure because they bring hydrocarbon traps almost to the surface of the land. Because of these complications, the AOR procedure described herein probably cannot be used field-wide for oilfields associated with shallow salt domes.

Table 3.2 shows the generalized stratigraphic nomenclature for the Texas Gulf Coast. Table 3.2 also identifies major hydrogeologic units (aquifers and confining layers) as well as significant hydrocarbon producing horizons.

All of the Tertiary age stratigraphic units listed in Table 3.2 are composed principally of clastic material ranging from sand size to clay size. While the sandy units are generally referred to as sandstones and the clayey units are often referred to as shales, the deposits are all very poorly consolidated and poorly cemented. In the strictest sense, the term "shale" is reserved for mudrocks that have fissility. Most of the mudrocks in the study area do not have well developed fissility and should probably be called mudstone rather than shale. In the report, the terms shale and mudstone are used interchangeably for what should probably, in the strictest sense, be called mudstone.

The overall stratigraphy of the Texas Gulf Coast is complicated. Although the stratigraphy within one field or county is typically fairly uniform in the sense that major sand units, such as Frio, or shale units, such as the Anahuac, are present in varying thicknesses throughout the field or county, significant differences occur between counties along depositional strike as well as updip and downdip.

Virtually all of the sand sequences have high porosity and permeability and, thus, the potential to make excellent petroleum reservoirs or groundwater aquifers. The shallow Miocene and Pliocene age horizons (Oakville, Lagarto and Goliad Formations) are typically non-marine fluvial and lagoonal sand and mudstone sediments through the study area. Thick sand sequences in the Miocene and Pliocene are, in some cases, minor gas reservoirs and, otherwise, are groundwater aquifers or make excellent sink zones for upward moving fluids.

Virtually all of the Miocene and Pliocene shales and mudstones are considered to have potential as good sloughing and squeezing zones. The shales and mudstones are poorly consolidated and many are known to contain swelling clays such as montmorillonite and bentonite.

### *1.3.1.2 Mitigating Geological Circumstances*

Mitigating geological circumstances that can prevent upward movement fluids to an aquifer include:

A. Sloughing and squeezing shales or mudstones that, in an uncased wellbore, will slough into or squeeze off vertical permeability, and

B. An intervening low pressure or normally pressured, high permeability zone (known as a sink zone) that would divert upward flow of fluids into that zone.

Environmentally, shales or mudstones of the Gulf Coast consist of three main types, marine, bay or lagoonal, and non-marine sediments that occur as overbank deposits in fluvial sequences and interdistributary areas on delta plains.

Bay, lagoonal and other non-marine mudstones tend to be thin and discontinuous laterally, though collectively they can combine to form important confining or sloughing and squeezing units.

From youngest to oldest, important Oligocene-Pliocene stratigraphic units that contain important sloughing and squeezing shales and confining units include:

Pliocene Willis Formation
Miocene Goliad Formation
Miocene Lagarto Formation
Miocene Oakville Formation
Oligocene Anahuac Formation
Oligocene Vicksburg Formation

In the fields in this study, only the post-Anahuac formations are of importance.

Within the study area, Miocene age stratigraphic units, including the Oakville and Largarto Formations of the Fleming Group and the Goliad Formation, have a total thickness of about 2,700 to 5,000 feet of non-marine fluvial and lagoonal sediments comprised of sand (<20 to 70%) and mudstone (30 to >80%). While we were not able to distinguish stratigraphic boundaries in our log studies, we believe that the shale (mudstone) units identified on the borehole logs of Appendix 2 are within the Oakville-Goliad Miocene sequence. These potentially sloughing and squeezing shale (mudstone) units are described to contain montmorillonite and bentonite clays that would be expected to enhance their sloughing and squeezing properties.

Sink zones are high permeability zones that are either normally pressured or underpressured. The Gulf Coast has many normally pressured shallow sandstones that are individually or collectively very thick. Any thick sandstone sequence that is normally pressured or underpressured can act as a sink zone for diversion of upward flowing fluids.

#### *1.3.1.3 Hydrogeology*

Table 3.2 identifies major aquifers and confining units relative to major oil and gas producing horizons in the Texas Gulf Coast. The Texas Gulf Coast is divided by Ryder and Ardis[17] into two major aquifer systems, the older *coastal uplands* aquifer system, and the younger *coastal lowlands* aquifer system. The two systems are separated by the Vicksburg-Jackson confining layer at the Eocene-Oligocene boundary. The uplands aquifer occurs entirely to the northwest of the are of this study, and only the lowlands aquifer is pertinent to this study. The lowlands aquifer is divided here into four permeable zones and two confining units as follows:

Pleistocene Chicot Aquifer
Pliocene Evangeline (Goliad) Aquifer
Miocene Burkeville (Largarto) Confining unit
Miocene Jasper (Oakville) Aquifer
Miocene Catahoula (Anahuac) Confining unit, (only in the subsurface), and the
Miocene Jasper (Frio) Aquifer (present only in the subsurface).

The stratigraphy of the aquifers and the confining units is multilayered and complex, and different authors subdivide the lowlands aquifer differently. All of the units dip gently to the southeast as well as thicken to the southeast. Aquifers are recharged from the northwest where they either intersect the land surface or are in communication with aquifers that intersect the surface. In general, the aquifers all contain fresh water at shallow depths near their surface exposures to the northwest, and salinities increase to the southeast as the aquifers descend into the subsurface. Sandstones that are well flushed by fresh water can contain potable water to depths as great as 3,000 feet. More typically, water becomes brackish in the 2000-foot depth range and saline in the 4000-foot depth range.

The deepest aquifer that contains water with less than 3,000 mg/l of dissolved solids within any significant part of the study area is the Evangeline aquifer. The Chicot aquifer is the principal fresh water bearing unit within the study area and even it has water with greater than 3,000 mg/l of dissolved solids in some parts of the area, particularly the extreme southern counties of Cameron, Willacy, Hidalgo and Kenedy; but also in the most coastal portions of some other counties that immediately border the Gulf of Mexico.

### 1.4 Texas Railroad Commission Regulations and AOR Variance Implications

The Texas Railroad Commission (TRRC) is the governing body which regulates well operations in the State of Texas. The Commission was formed on April 3, 1891, but the Oil and Gas Division was not created until 1919. Presently, the Commission is sub-divided into geographical districts. The districts which cover the Gulf Coast study area include Districts 2, 3 and 4.

Since inception, the TRRC has issued a number of orders or rules regarding the manner in which wells were to be completed and abandoned. It is important to understand the evolution of these rules, and the level of compliance with these rules as fields were developed. This is because fields whose discovery and development post dates well construction and abandonment rules describing adequate protection to overlying USDWs may qualify for an AOR variance.

One variance approach is the demonstration, using a representative sample of wells, that construction and abandonment practices provide adequate groundwater protection. Another approach is demonstration that field discovery and development occurred after promulgation of well construction and abandonment standards that provide adequate groundwater protection.

In the Permian Basin study the approach that was used was a combination of the approaches suggested above in that populations of active and abandoned wells were evaluated for selected age groups. Briefly, the Permian Basin study showed that active wells in all age groups are constructed so that they are protective of usable quality water (UQW) and that wells abandoned after 1982 and probably those abandoned during 1967-1982 are protective of UQWs. It was found, however, that abandonment information on some pre-1967 abandoned wells was lacking so that evaluation of that age group of abandoned wells was more difficult.

Based upon the Permian Basin study results, it was decided, in this Gulf Coast study, that it was unneccessary to evaluate active wells or wells abandoned after 1982, since it was believed that these wells would be protective of usable quality groundwater. Samples of wells abandoned during 1967-1982 and wells abandoned prior to 1967 were identified for evaluation in a pilot study in Refugio County and the results from Refugio County were then used to guide further study of pre-67 abandoned wells in eight other Gulf Coast counties.

## 1.5 Texas Gulf Coast Abandoned Well Studies

### 1.5.1 Databases for Study

A representative sample of wells was randomly drawn for review from each of the fields with active injection operations in the nine selected Texas Gulf Coast counties. Identification of well populations was performed using publicly available information obtained from the Texas Railroad Commission (TRRC) and commercial information obtained from Petroleum Information Corporation (PI).

The TRRC publishes several oil and gas field databases. The principal databases used in this study included the "Oil and Gas Well Bore System" (OGWBS), the "Oil and Gas Field Information" (OGFI), the "Oil and Gas P-4 Information" (OGP4I), the "Mapping Information Management System" (MIMS), and the Underground Injection Control (UIC) database.

Data were obtained from PI for all pre-67 abandoned wells in PI's master database for Refugio County and wells in the predetermined fields were selected for analysis. A total of 134 wells existed in this database, and a listing of them was sent to Banks Information Solutions (Banks) of Austin, Texas, for a search of the TRRC files for all file information, but particularly for the Form 4 abandonment forms.

### *1.5.1.2 Selection of Fields and Wells in Other Counties*

On completion of the Refugio County pilot study, the following eight Texas Gulf Coast counties were also evaluated: Brazoria, Chambers, Hardin, Jackson, Nueces, San Patricio, Starr, and Victoria (Figure 2.2). The fields to be studied were identified from the TRRC UIC database. As documented in a previous report, and confirmed in the Refugio County study, minimal information for pre-67 abandoned wells is contained in the TRRC OGWBS database. The single source for identification of pre-67 abandoned wells in Gulf Coast counties was the PI database.

Using the TRRC UIC database, the field selection criteria employed in Refugio County was applied to the additional eight Gulf Coast counties (i.e., all fields having a minimum of 5 active secondary recovery or disposal injection wells will be evaluated). This analysis resulted in 72 additional fields available for analysis in the eight counties in the Gulf Coast region. A breakdown of fields by county is shown below.

| County | Number of Fields |
|---|---|
| Brazoria | 15 |
| Chambers | 8 |
| Hardin | 7 |
| Jackson | 10 |
| Nueces | 7 |
| San Patricio | 7 |
| Starr | 9 |
| Victoria | 11 |
| **Subtotal** | 74 |
| Less White Point East Field (located in 2 counties) | -1 |
| Less McFaddin Field (located in 2 counties) | -1 |
| **TOTAL** | 72 |

Comparing the well data from the UIC database with the PI database, some fields were eliminated as they had no pre-67 abandoned wells. This resulted in 66 fields remaining available for analysis.

The 66 selected fields contained 3249 pre-67 abandoned wells. Of these 3249 wells, only 2562 had locational data which allowed mapping. Employing a 10% oversampling on an individual field basis (i.e., the 10% sample size was always rounded-up for each field), resulted in a sample of 359 wells, a list of which was sent to Banks for a search of the TRRC files for additional information. Well samples were drawn using the random number generator selection method described in the Permian Basin report. A per county well count of the samples selected is shown below:

| County | Number of Wells in 10% Sample |
|---|---|
| Brazoria | 92 |
| Chambers | 34 |
| Hardin | 73 |
| Jackson | 23 |
| Nueces | 48 |
| San Patricio | 29 |
| Starr | 39 |
| Victoria | 21 |
| **TOTAL** | 359 |

1.5.2 TRRC File Searches

Plugging data existed for only the post-66 wells in the TRRC database. All pre-67 wells in the TRRC database and all wells in the PI database contained no plugging information. As a result, plugging information was obtained using a manual search of the TRRC records. All available well information (e.g., field, API well number, construction information) was sent to Banks in Austin, Texas, where a manual search was performed to locate all file forms and, particularly, the Form 4 (Plugging Form).

1.5.3 Conclusions From Abandoned Well Studies

A sample of 138 wells believed to be abandoned during 1967-1982 was selected for study from nine oilfields in Refugio County. TRRC Forms 4 or W-3 were found for all of the 112 wells that were determined to actually be post-67 abandonments. Based on this Refugio County result, it is concluded that, as was expected, wells abandoned during and after 1967 are protective of usable groundwater and this age class of abandoned wells was not studied in the other eight Gulf Coast study counties.

In the Refugio County pilot study, the TRRC files were searched for data for all 134 wells contained in a Refugio County database created by PI to contain possible pre-67 abandonments. The file search results showed that 15 wells were not pre-67 abandonments. Of the remaining 119 wells, Forms 4 were found for 100 wells but were not found for 19 wells. Because the status and mechanical condition of these 19 wells was not determined, they are considered to be of possible concern in that they could be wells that, if in an AOR, would need corrective action to meet UIC requirements.

Because of the results of the Refugio County pilot study, examination of pre-67 abandoned wells was extended to eight additional Gulf Coast counties. Including Refugio County, a total of 493 wells was selected for analysis as possible pre-67 abandoned wells in the nine counties. Fifty (50) of the original 493 wells were determined to not be pre-67 abandonments. Of the remaining 443 possible pre-67 abandonments, Forms 4 were found for 362 wells but no abandonment data were found in the TRRC files for 81 of the wells. Those 81 wells are of possible concern in that their status and mechanical condition are unknown and they might, if in an AOR, require corrective action to meet UIC requirements.

It is believed, based on the Texas Permian Basin study and this study, that the only wells that would be likely to raise any TRRC concerns in AOR studies in the Texas Gulf Coast area will be in the pre-67 abandoned well population. The results described above show that TRRC file data are lacking for some percentage of that group of wells, about 18% in this study. Thus, well construction and abandonment characteristics of the majority of all wells would be such that AOR variances could be considered for Gulf Coast injection wells but a population of pre-67 abandoned wells exists that could preclude such variances. The next section describes the existence of mitigating geological circumstances that could ameliorate concerns about those pre-67 abandoned wells the status and mechanical condition of which are uncertain.

**1.6 Mitigating Geological Circumstances**

A possible basis for AOR variance is the availability of geologic conditions that preclude upward fluid movement through a pathway, such as an unplugged or inadequately plugged abandoned well.

1.6.1 Sloughing and Squeezing Shales

Some shales and some other types of sedimentary rocks exhibit a tendency to slough or cave into a borehole, thus acting as a naturally occurring plug. In other cases the shales expand and squeeze the borehole shut. Both effects can also occur behind the casing of a cased borehole to fill or close the behind-casing annulus.

Such shales or mudstones occur throughout the Texas Gulf Coast, interbedded with sands, from the ground surface to very great depths below the surface. More specifically, they are ubiquitously present in the depth interval of from a few hundred feet below the ground surface to about 4,000 feet which is the interval where they would be needed to close off any open boreholes between the base of the deepest usable quality groundwater and the top of the shallowest injection zone. While this general shale presence is well known, it must be demonstrated that the locations and amounts of shale are present in individual oilfields to satisfy criteria for those characteristics.

#### *1.6.1.1 Specific Availability in Study Fields*

To test the availability of sloughing and squeezing shales* for AOR purposes in specific individual oilfields, criteria for their location and thickness must first be established. In consultation with the TRRC, two thickness criteria were established.

1. A cumulative thickness of 250 feet.
2. A continuous thickness in one shale unit of 100 feet.

In addition to these two criteria, in analyzing borehole geophysical logs, only shale units of >20 feet in thickness were counted toward the cumulative 250 feet and sandstone units of > 10 feet in thickness were counted as breaks when cumulating the 250 feet of thickness and in locating the 100 feet of continuous shale.

To determine where in the vertical geologic column the shale units needed to be, the TRRC UIC computer data base was analyzed to show the deepest permitted base of usable quality groundwater in each analyzed oilfield.

After establishing the deepest base of usable quality groundwater in each oilfield, well logs were used to establish the presence and location of the 250 feet cumulative and 100 feet continuous shale intervals in the fields.

**Througout this section, the term shale is used whereas, as discussed in Sections 1.3.1 and 3.2, these deposits are probably Miocene-Pliocene age fluvial and lagoonal mudstones.*

Because a single log was selected for each oilfield, there is no assurance that the detailed location of the shale intervals in the borehole as interpreted from that log are representative of the entire field. However, the occurrence of shale intervals that meet the established criteria of 250 feet cumulative thickness and 100 feet continuous thickness in every oilfield and in every usable log studied is considered to be compelling evidence that such shale is present throughout the Gulf Coast study area, within the stratigraphic interval of interest.

No log interpretation was done for oilfields that had been identified as shallow piercement dome oilfields. These fields were excluded because their geology was considered to be too complex to allow any generalization of the presence and location of sloughing or squeezing shale intervals throughout the field. Such fields are probably not amenable, on a field-wide basis, to AOR variance based on geologic conditions.

#### *1.6.1.2 Evidence of Effectiveness*

The principal evidence for the effectiveness of Texas Gulf Coast shales in closing an open borehole comes from a 1991 study conducted by the E.I. du Pont de Nemours Company at a site near Orangefield, Orange County, Texas. The study was conducted to show that, in the study area, an open borehole will be naturally sealed by squeezing shales within a very short period of time. In the DuPont study, closure of the test borehole within one week was demonstrated to occur.

The shale section that was the subject of the DuPont test was the same Miocene age Fleming Group that is of interest in this study. The interval that caused the borehole closure during the DuPont test was at a depth of from 2838 feet to 2926 feet (88 feet) or roughly the same depth range and minimum continuous thickness of shale being suggested for borehole closure purposes in this study.

### 1.6.2 Sink Zones

Porous and permeable formations that are underpressured or normally pressured provide sink zones that can divert upward flowing fluids before the fluids can reach a UQW. The sands that are interbedded with squeezing shales, on an approximate one-to-one average basis in the study area, are normally pressured and constitute such sink zones. No detailed analysis of these zones is given because they are universally present and are considered to provide secondary protection, with the squeezing and sloughing shales being the more important source of protection for usable quality groundwater in pre-67 abandoned wells for which abandonment information is not available.

### 1.7 Extension of Study Results Within the Frio Formation Producing Trend

It is believed that the study results that have been previously described can probably be extended to all oilfields producing from the Frio Formation and deeper formations within the Frio producing trend that is shown in Figure 2.2. To facilitate this process, the UIC database for counties, other than the nine study counties, was searched for fields with five or more active permitted injection wells. There are at least 78 additional fields in the 17 counties that were searched that contain 5 or more active UIC permitted injection wells.

### 1.8 AOR Variance Recommendation

Based upon the study results that have been described, it is recommended that field-by-field AOR variances be considered for oilfields within the area of the Texas Gulf Coast Frio Formation producing trend as shown in Figure 2.2. The basis for a variance for a particular field would be demonstration of the presence of prerequisite amounts of cumulative and continuous shale between the deepest base of usable quality groundwater and the injection zone to be permitted. The procedures for such demonstration have been developed and presented herein and have been successfully applied to 57 fields in eight counties. There are at least 78 additional fields in 17 other Frio producing trend counties to which the recommended procedures may apply.

# 2.0 INTRODUCTION

## 2.1 Background

### 2.1.1 The Area-of-Review Requirement

The Underground Injection Control Regulations[1] promulgated in 1980, under the Safe Drinking Water Act of 1974, require Area-of- Review (AOR) studies be conducted as part of the permitting process for newly drilled or converted Class II injection wells[2]. Existing Class II injection wells operating at the time regulations became effective were excluded from the AOR requirement.

#### *2.1.1.1 Definition of the AOR*

The Area of Review (AOR) is the area surrounding an injection well or wells defined by either the radial distance within which pressure in the injection zone may cause migration of the injection and/or formation fluid into an underground source of drinking water (USDW) or defined by a fixed radius of not less than one-fourth mile. In the method where injection pressure is used to define the AOR radial distance, the AOR is also known as the "zone of endangering influence."

#### *2.1.1.2 Information Required for an AOR*

Underground Injection Control (UIC) Program requirements are enforced by the states, where the state has applied for and received primacy from the Environmental Protection Agency (EPA) under Section 1425 of the Safe Drinking Water Act. In Texas, the UIC program is administered by the Texas Railroad Commission (TRRC).

In conjunction with a TRRC application for a UIC injection or disposal well permit, applicants are required to submit a map showing the location and depth of all wells of public record within the AOR. For those wells which penetrate the top of the injection or disposal zone, the applicant must attach a tabulation of the wells showing the dates the wells were drilled and the status of the wells and to identify any abandoned well that is indicated to be unplugged or improperly plugged.

### 2.1.2 The AOR Variance Concept

In January 1988, the EPA initiated a Mid-Course Evaluation (MCE) of the adequacy of its regulations for Class II injection wells and, in August 1989, published a report of its findings. As a result of the MCE, EPA's Office of Drinking Water identified areas of concern to be further studied. Among the areas of concern was the need to further evaluate AOR requirements.

In April 1991, the agency proposed and did form a Federal Advisory Committee (FAC) whose charge was to make recommendations to EPA regarding the Class II injection well program. The Committee examined data and information gathered by the EPA during the MCE of the Class II program and, in subsequent studies, identified regulatory gaps and made recommendations for program changes where they were appropriate.

The FAC held its first formal meeting on June 11-12, 1991 during which the Committee approved its charter and identified issues to be addressed, including AOR requirements. The FAC met for a seventh and final time in January 1992. A March 23, 1992, draft Final Document (see Reference 3 or 4) was prepared summarizing the recommendations of the FAC. Those recommendations received formal endorsement by the organizations and individuals represented on the Committee in August, 1992.

With respect to the AOR requirement, the FAC reached consensus that an exception to this requirement should be allowed for those wells located in areas that have been granted a variance by the Program Director based upon criteria presented in an approved variance plan. Variances could be granted where there is sufficiently low risk of upward fluid migration from the injection zone into underground sources of drinking water.

The Final Document lists conditions that could be considered by a Director in determining whether to grant a variance. A variance could be granted based on information indicating any of the following conditions:

- the absence of USDWs,
- the reservoir is underpressured relative to the USDW,
- local geological conditions preclude upward fluid movement that could endanger USDWs, and/or
- other compelling evidence.

As is discussed below, the University of Missouri-Rolla (UMR), under contract with the American Petroleum Institute (API), expanded the FAC AOR variance recommendation into an AOR variance methodology[3,4] that was subsequently revised and adopted by the Underground Injection Practices

Foundation of the Ground Water Protection Council[5].

2.1.3 AOR Variance Methodology

The following discussion describes a methodology[3,4,5] developed for identifying a producing basin, trend, region or field or a portion of such areas which would be eligible for variance from AOR requirements. Five general methods (Figure 2.1) are proposed for obtaining variance from well-by-well AORs. These methods can be used in any order, singly or in combination, to provide variance for some or all wells. Wells not excluded by variance would be subject to conventional AORs.

It is believed that all five of the methods can be applied over large geographic areas but the four methods based upon geologic and hydrologic criteria are most easily visualized as "global" methods. The fifth method requires evaluation of the manner by which the wells in the area under consideration were completed and abandoned.

***2.1.3.1 Variance Based on Absence of USDW***

In some oil and gas producing areas, there are no USDWs. Any appropriate studies may be used to document this and to justify the granting of a variance from the AOR requirement. Further, "exempted aquifers" by regulatory definition are not USDWs[6] even though ground water total dissolved solids are less than 10,000 mg/l. States have exempted numerous aquifers since inception of the UIC program. Other aquifers may meet the criteria for exemption and operators may petition to have these aquifers exempted[7].

***2.1.3.2 Variance Based on Lack of Intersection***

"No Intersection" refers to the situation where a USDW exists and overlies a zone with Class II injection operations, but none of the wells adjacent to the injection well are drilled to the depth of the injection zone.

***2.1.3.3 Variance Based on Negative Flow Potential***

The FAC recommendations provide for the possibility of variance from the AOR process where the petroleum reservoir is underpressured relative to the USDW.

Flow potential information is generally available as measured water level (potentiometric head) data from wells completed in USDWs and as petroleum reservoir pressure data from oil and gas wells. References 3, 5, and 8 provide detailed discussion of the procedures for conversion of petroleum reservoir pressure data to potentiometric head data for comparison with USDW potentiometric head data. The procedures call for subtraction of USDW heads from petroleum reservoir heads to obtain a residual value. Areas with negative residual heads would be ones in which a variance based upon lack of flow potential would be possible.

#### *2.1.3.4 Variance Based on Mitigating Geological Factors*

The FAC variance criteria include the availability of local geologic conditions that preclude upward fluid movement that could endanger USDWs. Such mitigating geological factors include sloughing, squeezing and sink zones.

A sloughing formation refers to any geological horizon which is highly incompetent and tends to fall or cave into the wellbore, bridge off, and form a solid barrier to flow. A squeezing formation is one with strata that flow plastically under the overburden stress to close an uncased borehole or to close the casing-formation annulus in a cased well. Examples of sloughing and squeezing formations include unconsolidated shales, consolidated bentonitic shales, salt and anhydrite.

A sink or thief zone refers to a geological horizon which has a flow potential less than the overlying USDWs and the petroleum reservoir which contains injection operations. Sink zones, as used here, are intermediate formations (located between an injection zone and a USDW) which act to divert the fluids flowing up the wellbore. A sink zone can also be a normally-pressured formation that is so permeable and thick that it diverts virtually all upward flowing fluid[9].

#### *2.1.3.5 Variance Based on Well Construction and Abandonment Methods*

Well construction and abandonment methods can also be considered as a factor for an AOR variance. This is because the manner in which a well is constructed or abandoned may preclude fluid migration, even if a positive hydraulic flow potential does exist. States which have oil and gas production have historically set forth standards for well construction and abandonment. These standards detail the correct use or placement of casing, cement, bridge plugs, and other mechanical barriers in a wellbore.

*2.1.3.5.1 Alternative Variance Approaches*

On the basis of the historic sequence of development of construction and abandonment laws, regulations and practices, it is believed logical that well construction/abandonment based variances should be available through several different approaches, which are: 1. Field discovery and development occurs after promulgation of well construction and abandonment standards that provide adequate USDW protection. 2.Sufficient AORs exist and provide statistical evidence that all wells protect the USDWs. 3. A representative sample of wells is found to provide adequate protection to USDWs when the wells are evaluated with respect to flow barriers and plugs.

***2.1.3.6 Variance Based on Other Compelling Evidence***

While the authors and the many others that have participated in guiding and reviewing their work have attempted to identify as many bases for qualifying an area for variance as possible, there may be other opportunities that have been overlooked. In developing a variance plan, the states and EPA regions should remain flexible and not limit the information that will be considered in determining whether to grant a variance. This flexibility is needed to ensure variances can be obtained in all areas where injection wells pose sufficiently low risk to USDWs.

<u>2.1.4 Previous Studies</u>

As part of UMR's contract research for API, the AOR variance methodology was tested by application to the San Juan Basin of New Mexico[10,11] and the Permian Basin of Texas[12].

***2.1.4.1 San Juan Basin***

The first area to which UMR applied the AOR variance methodology described above was the San Juan Basin of New Mexico. The results of that study are described in a final report[10] to the API and in a summary paper[11].

The San Juan Basin is a nearly circular basin in the Four Corners region of New Mexico. Most of the basin is located in New Mexico, although the outer margins are located in Colorado, Utah and Arizona.

Oilfields with injection operations were identified and located throughout the basin. There were 24 oilfields with active injection operations in the San Juan Basin. No single variance criterion applied to all fields in the basin. There are, however, criteria that apply widely throughout the basin. These include: 1. Development of the field post-dates the establishment of regulations or rules that provide for adequate USDW protection. 2. Examination of a sample population of wells establishes that wells are constructed and abandoned so that they provide adequate USDW protection. 3. Sloughing and/or squeezing zones are present that may preclude upward fluid movement through an open wellbore or behind casing.

At least two variance criteria were found to apply to all 24 fields and are believed to provide good possibilities for variances for 20 fields and some possibilities for the remaining four.

#### *2.1.4.2 Permian Basin of Texas*

The AOR variance methodology has been applied to the Permian Basin, Texas, in order to determine the level of protection which producing and abandoned wells provide to USDWs throughout the basin[12].

The Permian Basin refers to an area in West Texas and New Mexico that is one of the most prolific oil producing areas of the world. A statistically valid sample of producing wells and plugged and abandoned wells was studied in 78 injection fields in eleven counties to determine the extent to which the construction and abandonment characteristics of these wells are protective of USDWs.

Examination of the well records for selected producing wells has shown that Permian Basin producing wells are constructed so that they are protective of USDWs.

With the exception of wells for which no records could be located, all abandoned wells examined in the Permian Basin study had plugging forms which showed notification to and approval by the TRRC. Based on the examination of records of abandoned wells in the Permian Basin study, it was determined that wells abandoned during and after 1967 have adequate and appropriately placed cement plugs to provide USDW protection. All but a few pre-1967 wells examined had TRRC plugging forms available. Examination of those abandonment records indicated that nearly all wells with records have adequate and appropriately placed cement plugs and are protective of USDWs. A few did not have cement plugs; however, in those wells, casing, behind casing cement, mud laden fluid and other features provide USDW protection. Comparison of the wells without TRRC plugging forms with other nearby wells showed that those few wells lacking abandonment records probably do provide USDW protection.

On the basis of the findings of this study, it is believed that the 78 injection fields should qualify for AOR variances based upon well construction and abandonment characteristics. By extension, other fields in these counties and in adjoining counties should also merit consideration for variances.

**2.2 Purpose and Scope of DOE Grant**

In the two API sponsored AOR variance studies described above, the principal data resources were public ones. The first one-year (5/94-5/95) phase of the DOE grant to UMR was for AOR variance study of the East Texas field, where it was anticipated that non-public data would be required, as was the case. Furthermore, it was believed that if an AOR variance could be obtained for the East Texas field, it would be of significant economic benefit to the field's operators, many of which are smaller independent producers.

Phase II of this DOE sponsored grant study was for AOR variance study of other Texas counties to be selected in consultation with the TRRC. The purpose of this phase of the grant was to further test and develop the AOR methodology by application to a previously unstudied area or petroleum province in Texas.

2.2.1 East Texas Field Study

The purpose of this sub-section is to provide a brief review of the results of the Phase I, East Texas field study as part of this final grant report.

The East Texas oil field is located in the extreme eastern part of Texas and comprises approximately 131,000 acres. The field was discovered in 1930 and is the largest oil field in the conterminous United States in the number of wells and volume of oil produced.

Because of pressure declines in the reservoir, the field has been undergoing water injection for pressure maintenance since 1938. As of 1995, a total of 104 Class II salt-water disposal wells, operated by the East Texas Salt Water Disposal Company (SWDC), were returning all produced salt water to the Woodbine sand producing reservoir.

At the suggestion of various East Texas field operators, and with the agreement and encouragement of the SWDC and the TRRC, UMR proposed to DOE a study of AOR variance opportunities for the East Texas field. A Steering Committee recommended that UMR study the variance method based upon the lack of sufficient petroleum reservoir pressure to cause flow into the lowermost USDW. A 1995 report documents the results of UMR's investigation of this variance option[13].

### 2.2.2 Selection of the Texas Gulf Coast Area for Study

In consultation with the TRRC, the Texas Gulf Coast area was selected because:

1. It has geologic characteristics quite different from any previously studied area and is large and generally geologically similar throughout.
2. There is substantial petroleum production from the area.
3. The Class II injection wells in the area are disposal wells, rather than enhanced recovery wells because the petroleum reservoirs are generally not amendable to waterflooding. Thus, the study would require an approach different than in any previous study.

In selecting the Gulf Coast area for study, it was generally understood that the area would include a band from the coastline inland, probably for several counties, and extending southwest from the Louisiana border to the Mexican border. No more exact definition of the study was adopted because it was expected that such definition would come from the study itself. It was agreed that the study would begin with centrally located Refugio County and would then expand, as appropriate, to additional counties. Figure 2.2 shows the location of Refugio County and the eight other counties subsequently selected for study. It also shows the general area of Texas Gulf Coast Frio Formation oil production that was, ultimately, defined as the area to which the results of this study should apply. Figures 2.3-2.9 show the locations of the oilfields studied within the Frio Formation oil producing trend.

The remainder of this report provides the details of the Texas Gulf Coast AOR variance study and the results of that study.

## 3.0 RESULTS AND DISCUSSION

### 3.1 The Texas Gulf Coast Study

Selection of the Texas Gulf Coast for study was made in consultation with the TRRC and approved by DOE in late 1994. Some preliminary work began in late 1994 and early 1995. After May, 1995, most grant work was focused on this Phase II effort.

In considering the study, the following concepts were used as starting points.

1. If a variance methodology or methodologies should be found to be applicable, the methodology or methodologies should apply over a large geographic area because of the relatively similar geology that is found throughout much of the Texas Gulf Coast.

2. Groundwater aquifers exist throughout most of the Gulf Coast and the petroleum producing reservoirs are generally either overpressured or normally pressured so that extensive variances based on lack of USDWs or on reservoir underpressuring would be unlikely.

3. Class II wells in the area would probably be disposal wells, rather than waterflood wells. They might or might not be located within oil field boundaries.

4. Based upon experience in the Permian Basin[12] it could be assumed that all wells would be constructed according to TRRC regulations and rules that are protective of usable groundwater and that wells plugged and abandoned after 1966 would probably be abandoned under TRRC regulations and rules that are protective of usable groundwater.

5. Because of the age of some Gulf Coast fields, it was believed likely that some wells, abandoned prior to 1967, would be identified for which TRRC records of abandonment would be incomplete or missing. It was expected that it would be difficult or even impossible to determine if such wells had been abandoned according to TRRC regulations and rules.

6. It was believed likely that sloughing and squeezing shale intervals and permeable sand sink zones would most likely be present to provide mitigating geological circumstances throughout the Gulf Coast. If present, such shales and sand could seal the wellbores and divert upward flowing formation water in the wellbores of any abandoned wells that might be unplugged or improperly plugged, thus providing protection to usable groundwater.

Study of area-wide topics such as geology and hydrogeology was carried out for the entire Gulf Coast simultaneously and will be reported that way. Study of individual oil fields began with Refugio County, as a pilot effort, and discussion of the field-by-field well-based results will focus first on Refugio County and then be expanded to the other eight counties, including, Brazoria, Chambers, Hardin, Jackson, Nueces, San Patricio, Starr and Victoria (Figure 2.2-2.9).

## 3.2 Geology and Hydrogeology of the Texas Gulf Coast

### 3.2.1 General Geology

The UMR AOR analysis procedure has been performed on 73 fields having injection operations in nine Texas Gulf Coast counties. From northeast to southwest the counties are Hardin, Chambers, Brazoria, Jackson, Victoria, Refugio, San Patricio, Nueces and Starr Counties (Figure 2.2). The following is a discussion of the structural geology and stratigraphy of the Texas Gulf Coast and their relevance to the petroleum geology and hydrogeology of the area.

### 3.2.2 Structural Geology

#### *3.2.2.1 General Structure*

The Texas Gulf Coast geologic province consists of Mesozoic and Cenozoic, mostly clastic, sedimentary strata that dip gently (average of about 1°) to the southeast towards the Gulf of Mexico. The nine counties are within a band about 30 to 80 miles wide, containing oilfields with dominantly Frio Formation oil production, that roughly parallels the Texas coastline from Louisiana to Mexico (Figure 2.2). In the subsurface and also paralleling the coastline through the nine county area is a series of major down-to-the-southeast listric-normal (growth) fault zones of which the most important are the Vicksburg and Frio fault trends (Figure 3.1).

As shown in Figure 3.2, this area contains two structural geologic embayments, the Houston Embayment centered near Houston, Texas, and the Rio Grande Embayment which occurs to the north of the Rio Grande River in south Texas. Parts of both embayments are underlain by deeply buried Louann salt of Jurassic age, and salt domes are present in parts (but not all) of both embayments. Located between the two embayments is a rather poorly defined high area known as the San Marcos Arch.

#### *3.2.2.2 Growth Faults*

Oilfields in the central and southern six counties (from northeast to southwest: Jackson, Victoria, Refugio, San Patricio, Nueces and Starr Counties--in the San Marcos Arch and Rio Grande Embayment area) are all associated with major down-to-the-southeast growth fault systems, the largest being the Vicksburg and Frio fault trends (Figure 3.1). Most oilfields through this part of Texas occur in rollover anticlines on the downthrown side (Gulf side) of the growth faults (Figure 3.3 & 3.4). The crests (axes) of the anticlines parallel the fault trends and typically occur from three to five miles to the southeast of the faults themselves. Oil and gas are not trapped against faults themselves, but rather in rollover anticline associated with the faults. Many of the anticlines are cut by spur and antithetic faults that may or may not act as seals for hydrocarbons.

Although major growth faults may penetrate to the land surface in some areas, and although pre-Miocene Tertiary age stratigraphic sections are often thin on the upthrown side of the faults, the faults do not seem to significantly affect the thickness or lithology of Miocene and Pliocene age strata. Thus, the AOR procedure described herein, which depends on the presence of Miocene and Pliocene age shales and mudstones, is not significantly affected by major growth faults, and the AOR procedure may be used on either side of the Vicksburg or Frio fault trends.

#### *3.2.2.3 Salt basins and salt domes*

The northern three study counties (from northeast to southwest: Hardin, Chambers and Brazoria) are located in the Houston Embayment or Houston salt basin, and most oilfields in these and adjacent counties are related to salt domes. Salt domes in these counties are classified by Halbouty[14] into three types based on depth to the top of the dome. Shallow domes occur at less than 4,000 feet in the subsurface, intermediate domes occur between 4,000 feet to 10,000 feet, and deep domes are below 10,000 feet (Table 3.1 & Figure 3.5).

Although sedimentary strata associated with all salt domes have structural and stratigraphic complications, strata overlying the intermediate and deep seated domes of the study are do not seem to be disturbed to the point of disqualification of the AOR procedure described in this report. For this reason, intermediate and deep seated domes will be discussed together in this report.

Shallow salt domes are domes that often bring stratigraphic and structural disturbances to within several hundred feet of the land surface. In some cases mounds or hills can be observed on the land surface above such domes. Shallow domes are a particular problem for the AOR procedure because hydrocarbons commonly occur at extremely shallow depths near such domes. In some of the fields analyzed, some oil and gas reservoirs occur at depths shallower than the stated base of usable quality water. Because of these complications, the AOR procedure described herein probably cannot be used field-wide for oilfields associated with shallow salt domes.

3.2.3 Stratigraphy

*3.2.3.1 General Stratigraphy*

Table 3.2 shows the generalized stratigraphic nomenclature for the Texas Gulf Coast. Table 3.2 also identifies major hydrogeologic units (aquifers and confining layers) as well as significant hydrocarbon producing horizons. Hydrogeologic data in this table are summarized from Ryder and Ardis[17] and oilfield information is primarily from Galloway[16].

All of the Tertiary age stratigraphic units listed in Table 3.2 are composed principally of clastic material ranging from sand size to clay size. While the sandy units are generally referred to as sandstones and the clayey units are often referred to as shales, the deposits are all very poorly consolidated and poorly cemented. In the strictest sense, the term "shale" is reserved for mudrocks that have fissility. Most of the mudrocks in the study area do not have well developed fissility and should probably be called mudstone rather than shale. However, for several of the marine mudstone units of the Gulf Coast, such as the Anahuac, the term shale has been used extensively in the literature. In this report, the terms shale and mudstone are used interchangeably for what should probably, in the strictest sense, be called mudstone.

The overall stratigraphy of the Texas Gulf Coast is complicated. Although the stratigraphy within one field or county is typically fairly uniform in the sense that major sand units, such as the Frio, or shale units, such as the Anahuac, are present in varying thicknesses throughout the field or county, significant differences occur between counties along depositional strike as well as updip and downdip. Figure 3.6 illustrates the lateral variation in sedimentary facies for the Oligocene Frio Formation, the principal oil and gas producing horizon for the Gulf Coast. Delta systems are concentrated in the Houston and Rio Grande Embayment areas, while bay and lagoonal muds, as well as strandline sands are concentrated along the San Marcos arch area, between the two embayments. Updip (to the northwest of the study area) non-marine fluvial systems dominate during Frio time, and downdip (to the southeast of the study area) marine muds are deposited on the continental shelf and slope.

Although Figure 3.6 illustrates facies patterns for the Oligocene Frio Formation only, the overall sedimentary facies distribution for all Tertiary rocks is similar, except that all facies are transposed landward on transgression and seaward on regression. At any one location, high sea level stands are marked by marine shales, and low sea level stands are marked by non-marine, typically fluvial and lagoonal sand and mud sediments. As the overall Tertiary sequence of the Gulf coast is regressive, the principal environment of deposition for the Miocene Oakville, Lagarto and Goliad Formations is non-marine, principally fluvial and lagoonal, in the nine counties of this study.

Virtually all of the sand sequences have high porosity and permeability and, thus, the potential to make excellent petroleum reservoirs or groundwater aquifers. On the downthrown side of major growth faults, the pre-Miocene Tertiary age sequences tend to be both sandier and thicker, as these areas were topographic lows (or depocenters) as the faults grew through time. Many barrier island and delta front sandstone sequences in the Paleocene, Eocene and Oligocene (major oil producing horizons) become thousands of feet thicker on the downthrown side of the Vicksburg and Frio faults. Thick sand sequences in the Miocene and Pliocene are, in some cases, minor gas reservoirs and, otherwise, are groundwater aquifers or make excellent sink zones for upward moving fluids.

Virtually all of the Miocene and Pliocene shales and mudstones are considered to have potential as good sloughing and squeezing zones. The shales and mudstones are poorly consolidated and many are known to contain swelling clays such as montmorillonite and bentonite[20,21].

In summary, the overall stratigraphy of the Gulf Coast is complicated. Throughout the study area, the deep oil and gas producing horizons are marked by strandline sand sequences that are unusually thick on the downthrown side of major growth faults. As the overall Gulf Coast sequence is regressive, the shallow Miocene and Pliocene age horizons are typically non-marine fluvial and lagoonal sand and mudstone sediments through the study area.

*3.2.3.2 Petroleum Reservoirs*

Because so many wells have been drilled in this area, and because the data from these wells are public information, the stratigraphy and depositional systems associated with hydrocarbon reservoirs of this area have been worked out in great detail. Galloway[16] has done an excellent job of illustrating the structure, stratigraphy and depositional systems of south and south central Texas.

Hydrocarbons are trapped in a number of different types of traps in the Texas Gulf Coastal areas. The most significant traps can be outlined as follows:

I. Structural traps
   A. Rollover anticline on the downthrown side of growth faults.
   B. True fault traps associated growth faults.
   C. Salt domes: Many different types of traps including:
      1. Anticline over top (supra dome anticline)
      2. True fault traps over the top.
      3. Cap rock.
      4. Flank traps, either against salt or shale sheath.
      5. True fault traps on the flanks.
   D. Other types of anticlines, such as "turtlebacks" caused by salt evacuation between salt domes.
II. Stratigraphic traps
   A. Fluvial and distributary channels.
   B. Updip pinchout of sand (such as barrier island sands).
   C. Unconformities, especially on the flanks of salt domes.

As shown in Table 3.2, the vast majority of Texas Gulf Coast oil production is from Yegua, Jackson, Vicksburg and Frio sands associated with growth faults (trap type I.A, above). The largest single producer is the Oligocene Frio Formation where it becomes sandy and very thick on the downthrown side of the Vicksburg fault (Figures 3.3 & 3.4).

Significant amounts of oil and gas occur in several types of traps over the tops of salt domes (Trap types I.C.1,2,or 3, above) but the largest volume of hydrocarbons associated with salt domes occurs on the flanks of the domes (trap type I.C.4, above).

*3.2.3.3 Shallow Strata*

Figures 3.7 and 3.8 are percent sandstone maps for the Miocene Lagarto and Goliad Formations, and Figures 3.9 and 3.10 show northwest-southeast (dip) cross sections for these same formations as well as the Miocene Oakville Formation. These formations contain the sloughing and squeezing mudstone sequences and sandstone sink zones in the study area. From Figures 3.9 and 3.10 it can be seen that, through the study area, these formations were deposited primarily in either fluvial or lagoonal settings. To the southeast and downdip of the study area, the formations were deposited in mixed strand plain, delta and, eventually, marine environments.

In Figures 3.7 and 3.8, fluvial facies can be identified by elongate concentrations of sand that are oriented generally perpendicular to the modern shoreline. These concentrations of sand are fluvial channel complexes that are composed of as much as 70 percent sandstone at a very few locations. Between the channel complexes are sand-poor areas that were deposited in flood plain or overbank environments of the fluvial systems. The flood plain areas typically contain less than 40 percent sand and commonly less than 20 percent sand. The lagoonal areas are also sand poor and commonly contain less than 20 percent sand. The significance of these maps and cross sections is that, throughout the study area, the shallow sequence typically contains at least 50 percent and never less than 30 percent mudstone.

From Figures 3.9 and 3.10, it can be observed that the shallow formations generally thicken to the southeast towards the Gulf of Mexico through the study area. The Oakville Formation ranges in thickness from 800 to 1400 feet, the Lagarto ranges from 1000 to 2400 feet thick, and the Goliad ranges from 1000 to 1400 feet thick. Collectively they range in thickness from 2700 to 5000 feet thick. Through the study area and to the southeast (downdip) of the study area, Figures 3.9 and 3.10 show that the shallow formations become thicker on the downthrown side of some, but not all, of the growth faults. The effect of growth faults on the thickness and lithology of the shallow section is considered to be not significant through the study area. Updip of the study area, sandstones are recharged by fresh water where the formations are exposed at the surface.

Also shown in Figures 3.9 and 3.10 are the electric log responses through these formations. Particularly well shown is the log response to an upward decrease in ground water salinity in the sandstones of the study area (onshore logs). From deep to shallow, note that there is a general decrease in SP response as well as an increase in electrical resistivity. At a depth of approximately 2,000 feet, a transition zone occurs where both the SP and resistivity curves are suppressed. Although sand/shale ratios can be difficult to determine through this interval, detailed analyses of electric logs (Appendix 2) and correlation from other areas indicate that sand/shale ratios are no different through this internal than through the rest of the Miocene-Pliocene section.

Henke[20], in an evaluation of uranium deposits of the Beaumont Quadrangle, describes the Oligocene, Miocene and Pliocene section as having bentonites and bentonitic sandstones throughout. The bentonites are derived from reworked Cretaceous sediments as well as volcanic ashes that were deposited during major volcanic eruptions that occurred throughout Late Tertiary time in northern and western Mexico, and to a lesser extent, in west Texas. Anderson[21] reports sodium montmorillonites throughout the Oligocene and Miocene section of San Jacinto County, Texas. Bentonites and montmorillonites are well known for their swelling properties.

In conclusion, although sand content can be as high as 70 percent in some parts of the study area, significant total thicknesses of shale (mudstone) were found to be present throughout the Gulf Coast in the Miocene-Pliocene sequence. In addition, many of the mudstones are known to contain bentonite and sodium montmorillonite, both of which are clays that are well known for their swelling properties.

### 3.2.4 Oilfields

#### *3.2.4.1 General Discussion*

As shown in Tables 3.2 and 3.3, the vast majority of Texas Gulf Coast oil production is from Frio, Yegua, Jackson and Vicksburg clastic sedimentary rocks associated with major growth faults or with salt domes. As already mentioned, far and away the largest production is from the Oligocene Frio Formation, particularly from the barrier island-strand plain facies downthrown to the Vicksburg fault.

#### *3.2.4.2 Central Gulf Fields*

The oilfields in the central Gulf counties (from northeast to southwest: Jackson, Victoria, Refugio, San Patricio, and Nueces Counties) are typified by the Tom O'Connor field of Refugio County (Figure 3.11).

The Tom O'Connor field was discovered in 1934. It produces from a number of different sandstones in the Upper Tertiary section with the majority of the production coming from the Oligocene Frio

Formation (Figure 3.12). Figure 3.13 shows that Tom O'Connor and other similar fields are located in rollover anticlines downthrown to the Vicksburg fault where barrier island and strandline sand sections are greatly expanded.

The barrier island and strandline sands of the Frio trend are well known for their spectacular reservoir rocks. For the 46 Frio reservoirs in the trend, in-place reserves are estimated at over 4.2 billion barrels (Galloway[16]). Cumulative production has already exceeded three billion barrels and the overall recovery efficiency for the trend is estimated at 53 percent with some fields estimated at over 60 percent. The Tom O'Connor field alone has produced over 575 million barrels and has an ultimate recovery estimated at over 800 million barrels (Galloway[16]).

Virtually all of the fields in the central five counties have production from the Frio Formations, and most have lesser production from the Yegua, Jackson and/or Vicksburg Formations. In addition, all of the studied fields in these counties have shallow shale zones that have the potential to act as squeezing or sloughing zones.

***3.2.4.3 Houston Salt Basin Fields***

The Houston salt basin is typified by three types of fields. One is rollover on a growth fault similar to that described for the Central Gulf fields. The second is shallow, piercement salt dome fields, that is, fields that are associated with salt domes that penetrate to very close to the land surface, and the third is in association with intermediate to deep seated salt domes.

*3.2.4.3.1 Shallow piercement salt-dome fields*

Shallow piercement fields include Bryan Mound, Damon Mound, Hoskins Mound, Nash Dome, and West Columbia fields of Brazoria County, Barbers Hill, High Island and Moss Bluff fields of Chambers County, and Arriola, Batson, Saratoga and Sour Lake fields of Hardin County (Tables 3.1 and 3.3). The Sour Lake field is typical of the shallow, piercement type of salt dome. The top of salt in the Sour Lake field occurs at about 1,800 feet and the cap rock comes to within 660 feet of the surface. Production occurs in three types of traps: (1) flank production, (2) supra dome production, and (3) cap rock production. In the Sour Lake field and throughout most fields of the Gulf Coast, the majority of the production is from the flanks (Figure 3.14).

Flank Production: Traps on the flanks of salt domes are typically numerous, complex and of many different types. The most typical traps occur where reservoir rocks are truncated against salt itself, but other types of traps include true fault traps, reservoir pinch outs, and traps against unconformities (see the Yegua in Figure 3.14).

Supra dome production: As they push upwards most salt domes produce anticlines in the sedimentary rocks above them, and supra dome production is from these overlying anticlines. Typically, supra dome anticlines are highly faulted, and many fault traps are also typical of the supra dome location (Figure 3.14).

Cap rock production: Cap rocks are typically composed of limestone and insoluble residues that accumulate in a complex chemical environment at the very tops of most salt domes. Cap rocks are noted throughout the Gulf for containing free sulfur and sulfide minerals that are thought to have formed by complex chemical reduction of sulfur from anhydrite ($CaSO_4$) by heterotrophic bacteria. In the process the bacteria metabolize hydrocarbons and produce "inorganic" (meaning no fossils) $CaCO_3$, limestones that are typically very dense and highly fractured.

In addition to being chemically complicated, cap rocks are often structurally complicated as well. One author described the cap rock of one field as being similar to a pane of glass that has been shattered by being thrown on the floor. Faults are everywhere and some salt domes have hundreds of wells into cap rock reservoirs where each well is thought to be in a separate fault block.

The Sour Lake field (Figure 3.14) illustrates why the AOR procedure described in this report does not apply to shallow piercement domes. They are stucturally and stratigraphically very complicated, and the hydrogeology is equally complex. Above such domes there is typically a complex interplay of fresh water derived from shallow aquifers with salt water derived from dissolution of salt from the salt dome. Salt brines derived from the salt dome can occur in close proximity to fresh water near a salt dome. Oil and gas reservoirs in the cap rock and supra dome areas commonly occur at elevations that are higher than fresh water zones on the flanks of the dome. Major shale sections that could act as sloughing or squeezing zones as well as major reservoir rocks that could act as sink zones are commonly faulted out or pinched out near the crest of such domes. Shallow, piercement salt domes are so complicated and variable that it is dangerous to make all-encompassing rules or generalizations about them.

*3.2.4.3.2 Intermediate and Deep Seated Salt Dome Fields*

Intermediate and deep seated domes include Danbury, Hastings, and Manvel fields of Brazoria County, and Anahuac, Fig Ridge, Lost Lake and Oyster Bayou fields of Chambers County.

The majority of the production from intermediate and deep seated domes is from supra dome anticlines. Such anticlines are typically large and highly faulted as exemplified by the Anahuac field (Figure 3.15).

Intermediate and deep seated salt domes have many of the structural and stratigraphic complications associated with shallow domes, but the shallow hydrogeology of intermediate and deep domes is not generally affected by these complications. That is, shallow faulting and some thinning of sediments certainly occurs over such domes, but these complications are not great enough at shallow depths to significantly affect important sloughing and squeezing shales, confining layers, or sink zones.

***3.2.4.4 Rio Grande Embayment Fields***

Production from salt dome related fields does occur in parts of the Rio Grande Embayment, but not in counties of this study. Rio Grande Embayment fields included in this report occur in Starr County and the southern part of Nueces County (Figure 3.2), and all fields are associated with fluvial and deltaic sandstones along the Vicksburg fault zone. These fields include all the fields in Starr County plus Agua Dulce and Richard King of Nueces County.

Upper Frio sands are typically fluvial, while lower sands are deltaic distributary channel sands that are draped over growth fault anticlines. Many channels are stacked on top of each other creating individual fields that commonly have from 20 to 40 stacked reservoirs. Many of the reservoirs are compartmentalized by mud-filled channel plugs.

### 3.2.5 Mitigating Geological Circumstances

Mitigating geological circumstances that can prevent upward movement of fluids to an aquifer include:

A. Sloughing and squeezing shales or mudstones that, in an uncased wellbore, will slough into or squeeze off vertical permeability, and
B. An intervening low pressure or normally pressured, high permeability zone (known as a sink zone) that would divert upward flow of fluids into that zone.

#### *3.2.5.1 Sloughing and Squeezing Shales*

Environmentally, shales or mudstones of the Gulf Coast consist of three main types, marine, bay or lagoonal, and non-marine sediments that occur as overbank deposits in fluvial sequences and interdistributary areas on delta plains. Marine shales, such as the Anahuac (Table 3.2), tend to be thick and continuous over large areas, though they thin and pinch out updip. Where they are present, they form important confining units both for shallow aquifers and for deeper trapping of hydrocarbons and overpressures. The Anahuac is one of the most important seals for hydrocarbons and overpressures in the Gulf Coast. Most oil and gas reservoirs above the Anahuac in the Gulf Coast are normally pressured, whereas those deeper than the Anahuac are commonly overpressured.

Bay, lagoonal and other non-marine mudstones tend to be thin and discontinuous laterally, though collectively they can combine to form important confining or sloughing and squeezing units.

From youngest to oldest, important Oligocene-Pliocene stratigraphic units that contain important sloughing and squeezing shales and confining units include:

Pliocene Willis Formation
Miocene Goliad Formation
Miocene Lagarto Formation
Miocene Oakville Formation
Oligocene Anahuac Formation
Oligocene Vicksburg Formation

In the fields in this study, only the post-Anahuac shales are of importance.

As has been described in Sections 3.2.3.1 and 3.2.3.3, within the study area, Miocene age stratigraphic units, including the Oakville and Lagarto Formations of the Fleming Group and the Goliad Formation, have a total thickness of about 2,700 to 5,000 feet of non-marine fluvial and lagoonal sediments comprised of sand (<20 to 70%) and mudstone (30 to >80%). While we were not able to distinguish stratigraphic boundaries in our log studies, we believe that the shale (mudstone) units identified on the borehole logs of Appendix 2 are within the Oakville-Goliad Miocene sequence as shown in Figures 3.9 and 3.10. These potentially sloughing and squeezing shale (mudstone) units are described to contain montmorillonite and bentonite clays[20,21] that would be expected to enhance their sloughing and squeezing properties.

#### *3.2.5.2 Sink Zones*

Sink zones are high permeability zones that are either normally pressured or underpressured. In the Gulf Coast, significant underpressures are believed to always be associated with artificial depletion of a reservoir. An oil or gas reservoir that has been depleted or partially depleted or an aquifer that has been severely drawn down by pumping can act as a sink zone. The Gulf Coast also has many normally pressured shallow sandstones that are individually or collectively very thick. Any thick sandstone sequence that is normally pressured or underpressured can act as a sink zone for diversion of upward flowing fluids.

### 3.2.6 Hydrogeology

Table 3.2 identifies major aquifers and confining units relative to major oil and gas producing horizons in the Texas Gulf Coast. The Texas Gulf Coast is divided by Ryder and Ardis[17] into two major aquifer systems, the older *coastal uplands* aquifer system, and the younger *coastal lowlands* aquifer system. The two systems are separated by the Vicksburg-Jackson confining layer at the Eocene-Oligocene boundary. The uplands aquifer occurs entirely to the northwest of this study, and only the lowlands aquifer is pertinent to this study. The lowlands aquifer is divided here into four permeable zones and two confining units as follows:

Pleistocene Chicot Aquifer
Miocene Evangeline (Goliad) Aquifer
Miocene Burkeville (Lagarto) Confining unit
Miocene Jasper (Oakville) Aquifer
Miocene Catahoula (Anahuac) Confining unit, (only in the subsurface), and the
Miocene Jasper (Frio) Aquifer (present only in the subsurface).

The stratigraphy of the aquifers and the confining units is multilayered and complex, and different authors subdivide the lowlands aquifer differently. All of the units dip gently to the southeast as well as thicken to the southeast. Aquifers are recharged from the northwest where they either intersect the land surface or are in communication with aquifers that intersect the surface. In general, the aquifers all contain fresh water at shallow depths near their surface exposures to the northwest, and salinities increase to the southeast as the aquifers descend into the subsurface. Sandstones that are well flushed by fresh water can contain potable water to depths as great as 3,000 feet. More typically, water becomes brackish in the 2000-foot depth range and saline in the 4000-foot depth range (Figures 3.9 and 3.10 and logs of Appendix 2).

Within the Frio Formation producing trend that is of interest in this study, the Frio portion of the Jasper aquifer occurs at depths below 4,000 feet and contains only saline water. Ryder and Ardis[17], in their Figure 21, show the Frio and equivalent interval to contain water with greater than 10,000 mg/l of dissolved solids throughout the study area of this report. The deepest aquifer that contains water with less than 3,000 mg/l of dissolved solids within any significant part of the study area is the Evangeline aquifer (Figure 19 of Ryder and Ardis[17]). The Chicot aquifer is the principal fresh water bearing unit within the study area and even it has water with greater than 3,000 mg/l of dissolved solids in some parts of the area, particularly the extreme southern counties of Cameron, Willacy, Hidalgo and Kenedy; but also in the most coastal portions of some other counties that immediately border the Gulf of Mexico (Figure 17 of Ryder and Ardis[17]).

### 3.3 Texas Railroad Commission Regulations and AOR Variance Implications

The Texas Railroad Commission (TRRC) is the governing body which regulates well operations in the State of Texas. The Commission was formed on April 3, 1891, bu the Oil and Gas Division was not created until 1919. Presently, the Commission is sub-divided into geographical districts. The districts which cover the Gulf Coast study area include Districts 2, 3 and 4.

Since inception, the TRRC has issued a number of orders or rules regarding the manner in which wells were to be completed and abandoned. It is important to understand the evolution of these rules, and the level of compliance with these rules as fields were developed. This is because fields whose discovery and development post dates well construction and abandonment rules describing adequate protection to overlying USDWs may qualify for an AOR variance[3,4,5].

The TRRC well construction and abandonment rules for Texas were researched and summarized by Mr. Dwight Smith[22]. This work, in addition to discussions with Mr. Jerry Mullican of the Texas RRC, forms the basis of comments made herein.

3.3.1 Well Construction

The earliest record of statewide rules regarding oil well construction are those of 1919. At that time, the well construction was meant to conserve and contain fresh water, oil and gas in their respective strata. However, the requirements of these early rules were written in a general manner. For example, there is a requirement that "no well shall be drilled through or below any oil, gas or water stratum without sealing off such stratum or the contents thereof, after passing through the sand, either by the mud-laden fluid process or by casing and packers, regardless of volume or thickness of sand." Specific requirements, such as running surface casing below fresh water sand or cementing casing in place, evolved at a later time.

The first comprehensive rules regarding wellbore casing and cementing were enacted in 1931 and later in 1943 (Figures 3.16 and 3.17). A surface casing string was required to be run and to be cemented from the shoe to surface. Production casing, where run, was required to be cemented to a point at least 600 feet above the shoe. Casing was expected to pass a bailing test for quality of the seal, and all oil, water and gas strata were required to be properly sealed off. These rules remained essentially unchanged until 1950.

In 1950 changes were included in the surface casing rule to allow an exception to the length of surface casing required if multi-stage cementing of the production string was envisaged (Figure 3.18). This exception was based on special request or application to the TRRC. Two years later, casing program exceptions were defined within statewide Rule 12, the principal casing and cementing rule. Rule 12 also required flowing wells to be completed with a string of tubing at this time.

In 1956 an order was issued requiring that disposal wells be cased and cemented. The order allowed the TRRC to handle disposal well permits administratively rather than requiring a public hearing.

Rule 12 remained the principal well construction rule until 1963, when the provisions outlined in Rule 12 were reissued as Rule 13 (Figure 3.19). The casing and cementing requirements defined in Rule 13 are similar to those initially required in 1931, although exceptions are outlined for shorter surface strings and multi-stage cementing of the production string.

Only minor changes occurred to Rule 13 from 1963 to 1982. Certain reports and forms for cementing were required in 1970. In 1971 the TRRC was given the power to grant exceptions to casing programs administratively.

Definitions of "stand under pressure", "zone of critical cement", "protection depth" and "productive horizon" were added to Rule 13 in 1983, and the title of the Rule was expanded to include both casing and cementing (Figure 3.20). Surface casing requirements were relaxed somewhat in that wells less than 1000 feet deep were not required to have surface casing provided that the production string was cemented back to surface. Intermediate strings were required to be cemented at least 600 feet above the intermediate casing shoe.

The last revision to Rule 13 was in 1991, but recent revisions have been minor modifications in language or more detailed requirements for offshore wells. The fundamental construction requirements for onshore wells described under Rule 13 have not changed appreciably since 1981.

3.3.2 Well Abandonment

The initial plugging rule, Rule 10, was issued in an order dated July 26, 1919. This rule defined the manner of plugging as "all dry or abandoned wells must be plugged by confining all oil, gas or water to the strata in which they occur by the use of mud laden fluid filling well to the top as directed by the Commission, or by some other method approved by the Commission. In case of cable tool drilling, in addition to mud laden fluid, cement and plugs may be used, and shall be used when so directed." This original plugging rule remained essentially unchanged until the 1930s, although a separate article was published in 1925 describing similar abandonment methods for plugging active wells.

In 1934 detailed abandonment requirements were specified regarding the manner in which wells were to be plugged (Figures 3.21, 3.22, 3.23 and 3.24). Dry or abandoned wells were to be plugged within a period of 20 days after drilling or production operations cease. Rule 10 defined methods of abandonment for producing wells, specifying cementing requirements for production casing, screens or perforated liners. Wells completed as non-producers could still be plugged with mud-laden fluid if there were no exposed commercial water zones or high pressure gas formations. The regulation also stated that "after the producing formation has been protected, the hole shall be filled from the top of the cement plug to the surface with 10 ppg mud unless high pressure gas strata or water strata need additional protection."

Rule 10 remained essentially unchanged until 1967. However, in 1957 Rule 15 was added. This rule described surface casing to be left in place at abandonment. Specifically, fresh water sands were to be protected with cemented casing and such casing should not be removed from the well at abandonment. Exceptions to this rule applied only if a short string of surface casing was set and cemented with the intention of using a multi-stage tool below fresh water sands, or if it was intended to cement the entire long or intermediate string of casing from casing set to the surface. If the well was a dry hole, the short string of surface casing had to be cemented in its entirety, and the deepest fresh water zone had to be protected by a cement plug covering the deepest water zone and at least 50 feet above and below the zone.

In 1966, specific and detailed descriptions were added to the plugging rule. These regulations were included as statewide Rule 14 (Figures 3.25, 3.26, 3.27, and 3.28). A 100 foot cement plug was required immediately above perforated zones, but the District advisor was granted authority to approve the use of bridge plugs with 20 feet of cement. Perforated screens or liners were to be retrieved when possible, or cemented back to a point at least 100 feet above the top of the liner. If production casing was removed from the well, a 100 foot cement plug was required across the shoe of the surface casing. In addition, if the surface casing was insufficient to protect fresh water horizons and they were exposed when production casing was removed from the well or as a result of production casing not being run, then a cement plug was required. This plug was to extend 50 feet above and 50 feet below the fresh water zone.

Rule 14 also required a 10 foot surface plug and additional cement spacer plugs to adequately cover and contain any high pressure gas or water sands. Mud laden fluid of at least 9.5 ppg was required to be placed in all portions of the well not filled with cement. All plugs were to be placed by the circulation method while the hole was in a static condition.

Rule 14 was amended in 1969 to allow a landowner to file an application to condition an abandoned well located on his land for fresh water production operations. The regulations specifically stated that, by doing so, the landowner assumed responsibility for ultimately plugging the well.

During the 1970s there were memoranda regarding permissible shut-in periods. These memoranda led to the extension of Rule 14 in 1975, to include specific language regarding temporary abandonments.

In 1983, comprehensive language was added to the plugging rule and some modifications were specified (Figures 3.29, 3.30, 3.31, 3.32 and 3.33). Operators were required to use only cementers approved by the director of field operations. (The regulation detailed how cementing companies, service companies or operators could become qualified as approved cementers.) A 10% excess cement volume based on depth was required for cement plugs, and all plugs except the surface plug were required to be 100 feet. The operator or cementer was required to tag the plugs to verify their placement. In addition, stricter requirements were added for cementing surface, intermediate and production casing, e.g. squeeze operations are defined for the first time.

Rule 14 has not changed substantially since 1983. Most of the memoranda issued in the 1980s address issues regarding financial security, financial assurances for time extensions for plugging a well, and designations of the responsible party for plugging a particular well. More specific language was added to Rule 14 in 1986 and 1988, but there were only minor changes to the manner in which wells were to be plugged. In 1987, plug back operations and zone abandonments were included in Rule 14, but the procedures outlined were similar to plugging methods described historically. Finally, in 1990 the Commission issued a detailed policy with respect to appropriate actions in cases where wells had been orphaned or improperly plugged.

### 3.3.3 Determination of Dates of Adequate Well Construction and Abandonment

In order to identify a time, or a period of time in which well construction and abandonment regulations provided adequate protection to overlying usable quality groundwater (UQW), it is first necessary to define what constitutes a (minimum) adequate level of protection for UQWs.

During 1980, the Environmental Protection Agency adopted regulations under the Safe Drinking Water Act which defined Underground Sources of Drinking Water (USDWs) and their required level of protection. These regulations required protection of waters with salinities of less than 10,000 mg/l. Since enactment of the Federal regulations, the State of Texas has required surface casing protection of usable quality groundwater (UQW) with salinities of 3,000 mg/l or less. Aquifers with salinities ranging between 3000 mg/l and 10,000 mg/l are protected from injected fluids.

From a review of the Texas State regulations it is apparent that the well construction regulations since 1931 require some protection of UQWs since the regulations specify water, oil and gas be confined and protected in their respective stratum. Rule 16 (1934) specifically states that "no well shall be drilled through or below any oil, gas or water stratum without sealing off such stratum or the contents thereof, after passing through the sand, either by the mud-laden fluid process or by casing and packers, regardless of volume or thickness of sand." The intent of this rule was to have casing, or casing and cement covering the fresh water aquifers. This is reflected in Rule 12, also issued in 1934:

> "Any well drilled in any field or area shall be required to set and cement a sufficient amount of surface casing to properly protect fresh water sands which are or may be a source of water supply for that area or field. Cementing shall be by pump and plug method and sufficient cement shall be used to fill the annular space back of the casing to the surface of the ground or to the bottom of the cellar. ..."

The abandonment regulations enacted in 1934 also required some protection of fresh water aquifers in abandoned wells. At that time, Rule 10 required a well to be plugged back with cement to a point at least 50 ft above the shoe of the producing string (Figure 3.21). For wells where the producing string was not cemented, the entire producing formation was to be plugged off with cement before the casing seat was broken. In wells completed with screen or perforated liners (Figure 3.22), if it was impractical to remove the screen or perforated liner, then the well was to be cemented back to a point at least 10 feet above the top of the liner. However, wells completed as non-producers (Figure 3.23) which did not encounter any commercial water sands or high pressure gas sands could be abandoned with mud laden fluid and, therefore, would not have a cement plug present.

Rule 10 also specified that when high pressure gas strata or water strata need additional protection, the Deputy Supervisor shall protect such strata or horizon by cementing from a point ten feet below said formation to a point ten feet above said formation.

Although the well construction and abandonment rules of the mid-1930s required protection of fresh water, these rules cannot be considered as a benchmark for adequate protection to UQWs, as defined today. It is likely that the fresh water aquifers of concern in the 1930s may have been considerably less saline than those presently defined as UQWs. Hence, waters which qualify as UQWs by current standards may not necessarily have been adequately protected by the early regulation.

Another concern regarding early regulations is that the method of determining minimum casing points is not specified. Rule 12 of 1934 requires "a sufficient amount of surface casing to properly protect fresh water sands which are or may be a source of water supply for that area or field", but does not describe how casing points will be determined or what parties will be responsible for such decisions. This issue was not clarified until 1950, when Rule 12 was amended to include the following language:

> "An operator shall, before drilling and setting casing in his first well in a field or area, contact the Board of Water Engineers and obtain a letter from this agency stating where the fresh water sands are found in the area of field in question and must set the amount of surface casing required by the Board of Water Engineers to protect all fresh water sands."

At present, casing depths are set for a field or an area by the surface casing unit of the Texas Natural Resource Conservation Commission (TNRCC). UQWs are protected on a well-by-well basis as specified by the TNRCC.

The lack of specificity in the early regulations was improved through subsequent changes in their form and language. However, these changes occurred over a long period of time, i.e. 1934 to 1980. For this reason, and also due to the lack of a formal definition of usable quality water, it was not possible to identify a specific year (or period of time) in the regulations in which wells could uncategorically be considered to provide adequate protection to present day UQWs. For this reason, the TRRC was queried regarding the time, or times, when it was felt that active and abandoned wells were required to provide adequate protection to UQWs.

In a 1993 telephone conversation, Mr. Jerry Mullican of the TRRC indicated that wells completed and abandoned prior to 1967 may or may not provide adequate groundwater protection, and those wells should be examined. Wells completed and abandoned from 1967 through 1982 should exhibit a high level of groundwater protection and good compliance with the regulations, but should receive sufficient study to confirm their condition. Further, he indicated that wells completed and abandoned since 1983 would provide adequate protection and, therefore, one should not need to study those wells.

Mr. Mullican's age categorization of wells appeared reasonable when compared to the historical progression of the well construction and abandonment regulations. For example, the level of specificity in the well plugging rule increases sharply in 1967, and again in 1983. The well construction rule has significant changes in 1950, 1957, and 1963, and then again in 1981 and 1983. Hence, it was decided, in the Permian Basin study, to adopt and test the time period categorization of wells (pre-1967; 1967-1982; post-1982) for sampling well popuiations. Results of the Permian Basin study supported the use of the age classification and it was adopted for further testing and subsequent use in this study as well.

3.3.4 AOR Variance Implications

As discussed in Section 2.1.3.5 well construction and abandonment methods can be considered as a factor for an AOR variance. One variance approach that is suggested is the demonstration, using a representative sample of wells, that construction and abandonment practices provide adequate groundwater protection. Another suggested approach is demonstration that field discovery and development occurred after promulgation of well construction and abandonment standards that provide adequate groundwater protection.

In the Permian Basin study[12] the approach that was used was a combination of the approaches suggested above in that populations of active and abandoned wells were evaluated for the age groups suggested in Section 3.3.3. Briefly, the Permian Basin study showed that active wells in all age groups are constructed so that they are protective of UQW and that wells abandoned after 1982 and probably those abandoned during 1967-1982 are protective of UQWs. It was found, however, that abandonment information on some pre-1967 abandoned wells was lacking so that evaluation of that age group of abandoned wells was more difficult.

Based upon the Permian Basin study results[12], it was decided, in this Gulf Coast study, that it was unneccessary to evaluate active wells or wells abandoned after 1982, since it was believed that these wells would be protective of usable quality groundwater. As will be discussed later, samples of wells abandoned during 1967-1982 and wells abandoned prior to 1967 were identified for evaluation in a pilot study in Refugio County and the results from Refugio County were then used to guide further study of pre-67 abandoned wells in eight other Gulf Coast counties.

### 3.4 Texas Gulf Coast Abandoned Well Studies

The following discussion details results of the abandoned well studies performed on the principal class II injection fields in nine Texas Gulf Coast counties.

#### 3.4.1 Data Bases for Study

A representative sample of wells was selected for review from each of the fields in the Texas Gulf Coast counties selected with active injection operations. Identification of well populations was performed using publicly available information obtained from the Texas Railroad Commission (TRRC) and commercial information obtained from Petroleum Information Corporation (PI).

##### *3.4.1.1 Texas Railroad Commission Databases*

The TRRC publishes several oil and gas field databases. The principal databases used in this study included the "Oil and Gas Well Bore System" (OGWBS), the "Oil and Gas Field Information" (OGFI), the "Oil and Gas P-4 Information" (OGP4I), the "Mapping Information Management System" (MIMS), and the Underground Injection Control (UIC) database.

Some wellbore construction and abandonment information is contained in the OGWBS database; however, this database was found to be of limited use primarily because the OGWBS was developed after 1976 and, as a consequence, does not contain substantial information on older wells. Older wells had to be identified with databases from PI and records for these wells obtained manually from TRRC files as discussed herein.

Another difficulty encountered in the OGWBS was that a field name was not associated with the wells. To solve this problem, a method of matching data from multiple databases was devised to provide the necessary information. Figure 3.34 depicts the databases and the matching technique employed to locate wells within Class II injection fields. Well data are available by county in the OGWBS, but as stated previously, wells are not directly referenced to fields in this database. In order to obtain field groupings of wells, the 5-digit field number must be extracted from the OGFI database using the lease number for a particular well available from the OGWBS. The lease number is matched with lease numbers in the OGP4I database which yields an associated field number. Finally, the field number is matched with the OGFI database which results in a field name.

The databases involved in these comparisons are quite large and would require a large storage mainframe or network computer system for analysis using the complete databases. Various sorting routines were employed to download data from a large mainframe computer and reduce the original large databases into county-wide and ultimately field-wide databases which were compatible with personal computing systems. Compression routines were used to create portability.

A record location is available in the OGWBS which indicates the reservoirs for the well. In principal, this record could be employed to sort wells by reservoir; however, this information was seldom complete for individual reservoirs which precluded sorting wells in a given field by reservoirs.

Locational information in the OGWBS was not useful in computer-plotting the wells. As a result, the API well number from the OGWBS was matched with the MIMS database to create field maps. Only wells with MIMS locations were studied. The well type was also obtained from both the OGWBS and the MIMS databases; frequently, the well type in the MIMS database did not agree with the OGWBS.

Once the wells in the selected Class II injection fields were located, they were further classified and categorized by age as suggested by the TRRC. The groupings consisted of:

1. Wells with no dates indicated
2. Wells drilled, completed or plugged prior to 1/1/67
3. Wells drilled, completed or plugged between 1/1/67 and 1/1/83
4. Wells drilled, completed or plugged on or after 1/1/83.

For each of the age categories shown, well counts are reported for the total number of wells available in the database, number of wells with locations, number of plugged wells, number of injection wells, and number of producing wells. These well counts are summarized in Table 3.4 for selected Refugio County fields.

It is important to recognize that the date reported in the OGWBS represents either drilling, completion, or plugging dates. The TRRC has not routinely updated the OGWBS for wellbore re-entry and, as a result, the dates associated with wells in the OGWBS generally reflect the status of the well at the time the data were entered. Logically, the last date should be the plugging date for a P&A well; however, if this information was lacking or incomplete, the completion and drilling dates were selected, respectively. In the research, the latest date available was employed in the initial well age classification, but manual searches of TRRC data resulted in an age re-classification of many wells owing to either additional wellbore completion/plugging information not originally in the OGWBS or to the determining of dates that were lacking in the OGWBS.

The UIC database contains data for fields with active and historical injection operations, including the number and types of UIC permitted injection wells in each field. This database was first used to identify fields with significant Class II injection operations in the Gulf Coast region.

Injection well data from the UIC database were also used to determine a maximum depth to the base of usable quality water (UQW) and the minimum depth of permitted injection for the fields investigated.

#### *3.4.1.2 Petroleum Information (PI) Databases*

A commercial database was purchased from Petroleum Information Corporation (PI) to supplement the OGWBS for pre-1967 abandoned wells. PI data were obtained for the nine counties studied in the Gulf Coast region. Useful information obtained from the PI database included the API well number, well locational data consisting of latitude, longitude, lease and field names, spud and completion dates, total depth, and some well construction details which were usually limited to casing size and depth. An abandonment date was also included in this database, but it was usually blank.

All of the pre-67 abandoned wells had to be located with respect to the active injection fields. This step was important because it was necessary to determine which wells were within field boundaries. Wells located in Refugio County which existed in both the MIMS and PI databases were combined by comparing the two databases with a computer program. As was the case with TRRC databases, extraction routines were constructed to obtain the necessary well data as commercial routines were either unavailable or inadequate.

Unfortunately, the PI databases contain only well construction data and do not contain any abandonment information. This limitation required that a manual search of TRRC well records would need to be performed on every well studied.

3.4.2 Selection of Fields and Abandoned Wells for Study

Oil fields with 5 or more active secondary recovery or disposal injection wells were considered to be fields with significant Class II injection operations and wells located within these fields were included in the study. Fields which met this criteria were identified using the TRRC UIC database. This database lists wells with present or past UIC permits and, where located in a field, gives the field name.

***3.4.2.1 Refugio County Pilot Study***

Refugio County (Figure 2.2) has a total of 5832 wells in the TRRC OGWBS. Data from the TRRC UIC database indicated that very few fields have secondary recovery injectors, so the combination of disposal wells (both those injecting into the producing zone and those injecting into non-producing zones) plus secondary recovery injection wells was evaluated. All fields having a total of 5 or more injectors of the combination indicated were evaluated. This consisted of 9 fields as shown in Figure 2.3: Bonnie View, Greta, Lake Pasture, La Rosa, McFaddin, Mary Ellen O'Connor, New Refugio, Old Refugio, and Tom O'Connor.

All wells in the TRRC OGWBS database were sorted into the four chronological groups as previously explained: No Date, pre-1967, 1967-82, post-1982.

*3.4.2.1.2 Post-1966 Wells*

Since Refugio County was to be used as the pilot study for the remaining Gulf Coast counties, all plugged wells in the 1967-82 era that had sufficient data available from the TRRC databases were identified for analysis; this data set contained 53 wells. An additional 85 wells were selected using manual searches resulting in a total of 138 wells to be analyzed. As explained in section 3.4.2.1.3, the additional 85 wells were originally selected as either Wells with No Dates or pre-67 wells, but searches of the TRRC files by Banks Information Solutions (Banks) of Austin, Texas, indicated all were either not plugged or were post-66 abandoned wells. A large number of wells had all data available except cement records; these wells were analyzed assuming no cement was employed. No additional data search was employed for 1967-82 plugged wells.

*3.4.2.1.3 Pre-1967 Wells*

All plugged wells with No Dates and with pre-1967 dates were reviewed for analyzable data. Data were found to be insufficient in every case, so these wells were sent to Banks Information Solutions for searches of TRRC files for additional data. A list of 85 plugged wells from the TRRC OGWBS database was sent to Banks where all of the wells were determined to be not plugged or to be post-66 abandonments. These 85 wells were included in the post-66 well analysis. Based on these results, the TRRC OGWBS was determined not to be appropriate for identification of pre-67 wells.

Data were obtained from PI for all pre-67 abandoned wells in PI's master database for Refugio County and wells in the predetermined fields were selected for analysis. A total of 134 wells existed in this database, and a listing of them was sent to Banks for a search of the TRRC files for all file information, but particularly for the Form 4 abandonment forms. The results of this search are given in Section 3.4.5.1.2.

***3.4.2.2 Selection of Fields and Wells in Other Counties***

On completion of the Refugio County pilot study, the following eight Texas Gulf Coast counties were also evaluated: Brazoria, Chambers, Hardin, Jackson, Nueces, San Patricio, Starr, and Victoria (Figure 2.2). The fields to be studied were identified from the TRRC UIC database. As documented in a previous report, and confirmed in the Refugio County study, minimal information for pre-67 abandoned wells is contained in the TRRC OGWBS database. The single source for identification of pre-67 abandoned wells in Gulf Coast counties was the PI database.

*3.4.2.2.1 Fields*

Using the TRRC UIC database, the field selection criteria employed in Refugio County was applied to the additional eight Gulf Coast counties (i.e., all fields having a minimum of 5 active secondary recovery or disposal injection wells will be evaluated). This analysis resulted in 72 additional fields available for analysis in the eight counties in the Gulf Coast region. A breakdown of fields by county is shown below.

| County | Number of Fields |
|---|---|
| Brazoria | 15 |
| Chambers | 8 |
| Hardin | 7 |
| Jackson | 10 |
| Nueces | 7 |
| San Patricio | 7 |
| Starr | 9 |
| Victoria | 11 |
| **Subtotal** | 74 |
| Less White Point East Field (located in 2 counties) | -1 |
| Less McFaddin Field (located in 2 counties) | -1 |
| **TOTAL** | **72** |

Comparing the well data from the UIC database with the PI database, some fields were eliminated as they had no pre-67 abandoned wells. This resulted in 66 fields remaining available for analysis. The fields and their locations are identified in Figures 2.4 through 2.9.

*3.4.2.2.2 Pre-1967 Wells*

The 66 selected fields contained 3249 pre-67 abandoned wells as shown in Table 3.5. Of these 3249 wells, only 2562 had locational data which allowed mapping. Employing a 10% oversampling on an individual field basis (i.e., the 10% sample size was always rounded-up for each field), resulted in a sample of 359 wells, a list of which was sent to Banks for a search of the TRRC files for additional information. Well samples were drawn using the random number generator selection method described in the Permian Basin report[12]. A per county well count of the samples selected is shown below:

| County | Number of Wells in 10% Sample |
|---|---|
| Brazoria | 92 |
| Chambers | 34 |
| Hardin | 73 |
| Jackson | 23 |
| Nueces | 48 |
| San Patricio | 29 |
| Starr | 39 |
| Victoria | 21 |
| **TOTAL** | 359 |

### 3.4.3 TRRC File Searches

Plugging data existed for only the post-66 wells in the TRRC database. All pre-67 wells in the TRRC database and all wells in the PI database contained no plugging information. As a result, plugging information was obtained using a manual search of the TRRC records. All available well information (e.g., field, API well number, construction information) was sent to Banks Information Solutions in Austin, Texas, where a manual search was performed to locate all file forms and, particularly, the Form 4 (Plugging Form).

### 3.4.4 Generation of Scout Tickets and Wellbore Drawings

Previous work[10,11,12] demonstrated that it is both necessary and advantageous to prepare wellbore schematics of the wells under consideration in order to accurately assess the flow barriers present in each well. Depending on availability, one can use several different sources of information for preparing the wellbore schematics; for example, commercial databases or company well records. The Texas Gulf Coast study utilizes the OGWBS database for abandoned wells dated 1967-82, and both the OGWBS and PI databases supplemented with manual records searches of the TRRC records for pre-1967 wells.

An access program was created to search and extract data from the OGWBS database. This program was used to obtain well counts for each field and to prepare a well report (scout ticket) summarizing the drilling, completion and abandonment data for the sampled well populations. Figure 3.35 shows an example scout ticket generated from the PI database. When available, construction and abandonment data from the scout tickets were used to prepare wellbore drawings for wells investigated in this study.

A separate access program was also written to obtain scout ticket data from the PI databases. As discussed, this database contained only construction data. Abandonment data for the PI wells had to be obtained by manual searches of the TRRC well records. The types of data which are available from the TRRC are summarized in Table 3.6.

Figures 3.36, 3.37 and 3.38 depict typical well data obtained from the TRRC. The data obtained include applications to drill, deepen, or plug back (Figure 3.36), reports indicating intention to plug (Figure 3.37), and final plugging records (Figure 3.38). These reports are TRRC forms and there are two generations of each form. For example, the final plugging record is now Form W-3, but evolved from Form 4.

Figures 3.36, 3.37 and 3.38 are representative of the data received for the studied wells. Form 2's were received for some of the wells studied, but were not necessarily available for all wells. Form 2A was available on most of the wells researched by Banks or the TRRC. Form 4's were received on most, but not all wells researched. The plugging information recorded on Form 4 was generally adequate, but some records did not provide details regarding the cement plugs used at abandonment.

Scout ticket and other well data retrieved were used to prepare wellbore schematics for each sampled well included in the study. Figures 3.39 through 3.43 depict typical wellbore drawings prepared in the Texas Gulf Coast study. Casing depths, casing cementing information, mechanical barriers, cement plugs and the depths of fresh water and active injection were shown as available.

Each of the wells with sufficient data was evaluated with the Automated Borehole Evaluation program (ABE). This program is discussed in detail in the AOR Variance Methodology report.[3,4,5] Briefly, the program counts casing and cement flow barriers which are present between the Class II injection zone and the overlying base of usable quality groundwater. The program assigns a numerical value for both a through pipe (TP) and behind pipe (BP) flowpath. Wells for which no abandonment data were found were evaluated in the presence of squeezing and sloughing shales (when applicable) to determine the potential flow path and the number of barriers to flow from the injection zone to the base of the UQW. The most conservative ABE values for each well studied are shown in Table 3.30. Some specific examples of this analysis are discussed in Section 3.5.1.4.

### 3.4.5 Analysis of Well Data

The following analysis of the well data generated during this study focuses first on Refugio County, since that county was selected for pilot study and the Refugio County results then guided the remaining work.

In Refugio County, wells abandoned between 1967 and 1982 (post-66 wells) and wells abandoned prior to 1967 (pre-67 wells) were studied. In the other eight counties, because of the Refugio County results, only pre-67 abandoned wells were studied.

#### *3.4.5.1 Refugio County*

##### *3.4.5.1.1 Post-66 Wells*

As discussed in Section 3.4.2.1.2, 138 wells believed to have been abandoned during 1967-1982 were selected for study from the TTRRC OGWBS. A list of these wells was provided to Banks Information Solutions (Banks) of Austin, Texas, which searched files of the TRRC for all available well forms and data, particularly the well abandonment Forms 4 or W-3. According to the TRRC, if such forms are on file, a well is considered to have been properly abandoned so that it is protective of usable quality groundwater.

Table 3.7 lists the 138 wells that were selected and studied in nine Refugio County oilfields and Table 3.8 summarizes data from Table 3.7. After TRRC file searches by Banks, it was determined that, of the 138 wells, 112 were actually post-66 abandoned wells while 26 of the wells were in some other status category, including current producer, current disposal well, shut-in or temporarily abandoned. A few of the post-66 abandoned wells were abandoned after 1982.

Table 3.8 shows that a Form 4 or W-3 was found for all 112 post-66 Refugio County abandoned wells. This result is consistent with UMR's Texas Permian Basin study[12] in which post-66 abandoned wells in that area were found to be protective of usable quality groundwater.

Because Forms 4 or W-3 were found for all of the sample of post-66 abandoned wells in Refugio County, abandoned wells in that age category were not studied in other Texas Gulf Coast counties.

*3.4.5.1.2 Pre-67 Wells*

The process of selection and data acquisition for pre-67 Refugio County wells is given in Section 3.4.2.1.3. In all, as shown in summary Table 3.9, 134 wells were selected for detailed study from the PI data base of pre-67 abandoned wells. After search of the TRRC files by Banks, it could be determined that 7 of the 134 wells were not actually abandoned and that 8 wells were post-66 abandonments.

Of the remaining 119 wells still considered to be possible pre-67 abandonments, Forms 4 were found for 100 wells but none were found for 19 wells. Table 3.10 provides details on all 134 wells, and, particularly, under the comments section, provides information on what forms were found in the TRRC files for the 19 wells that are shown by the PI data base to be pre-67 abandonments but for which no abandonment forms were located. These wells are considered to be of possible concern in that their status and condition are unknown and they might, if in an AOR, need corrective action to meet UIC requirements.

Because the 19 wells that were identified as possibly being of concern represent a significant percent (19/119 or 16%) of the total pre-67 abandoned wells in the nine Refugio County fields that were studied, the pre-67 abandoned well analysis was extended to eight selected other Gulf Coast counties to test the Refugio County results.

***3.4.5.2 All Counties***

Table 3.11 summarizes the data for all PI data base wells studied in Refugio and the eight other selected counties. These wells represent the total sample of 493 wells that were originally selected for study as possible pre-67 abandoned wells. Tables 3.12-3.19 summarize the well data by county for all counties but Refugio County, the data for which are shown in Table 3.9. Table 3.10 lists the individual well data for all counties but Refugio. The Refugio County individual well data are given in Table 3.10.

Summary Table 3.11 shows that, of the 493 wells originally thought to be possible pre-67 abandoned wells, 16 were found to not be abandoned and 34 were abandoned after 1966. Of the remaining 443 wells still considered to be possible pre-67 abandonments, Forms 4 were found for 362 wells but none were found for 81 wells.

Tables 3.10 (Refugio County) and Table 3.20 provide the details on all 443 wells and, particularly under the comments section, provide information on what was found in the TRRC files for the 81 wells that are shown by the PI data base to be pre-67 abandonments but for which no abandonment forms were located. These wells could be considered to be of possible concern in that their status and condition are unknown and they could be wells that, if in an AOR, would require corrective action in order to meet UIC requirements. The 81 wells of possible concern represent 18% (81/443) of the total pre-67 abandoned wells studied in the 73 fields in the nine study counties. This is remarkably consistent with the 16% wells of concern in the Refugio County pilot study.

### 3.4.6 Conclusions From Abandoned Well Studies

As discussed in Section 3.3, a previous study of the Texas Permian Basin[12] showed that abandoned wells in that area could be considered in three age groups, pre-1967, 1967-1982 and post-1982. In the Permian Basin study it was found that data were available to demonstrate that wells abandoned during and after 1967 were protective of usable quality groundwater. In the case of pre-1967 abandoned wells, abandonment data could not be found for some wells, which made demonstration of the adequacy of abandonment of wells in that age group more difficult.

As a result of the Permian Basin study results, it was decided that post-82 abandoned wells did not require examination in this Gulf Coast study but that the 1967-1982 and pre-1967 abandoned wells should be studied in a Refugio County pilot study.

A sample of 138 wells believed to be abandoned during 1967-1982 was selected for study from nine oilfields in Refugio County. TRRC Forms 4 or W-3 were found for all of the 112 wells that were determined to actually be post-66 abandonments. Based on this Refugio County result, it is concluded that, as was expected, wells abandoned during and after 1967 are protective of usable groundwater and this age class of abandoned wells was not studied in the other eight Gulf Coast study counties.

In the Refugio County pilot study, the TRRC files were searched for data for all 134 wells contained in a Refugio County data base created by PI to contain possible pre-67 abandonments. The file search results, which are summarized in Table 3.9, showed that 15 wells were not pre-67 abandonments. Of the remaining 119 wells, Forms 4 were found for 100 wells but were not found for 19 wells. Because the status and mechanical condition of these 19 wells was not determined they are considered to be of possible concern in that they could be wells that, if in an AOR, would need corrective action to meet UIC requirements.

Because of the results of the Refugio County pilot study, examination of pre-67 abandoned wells was extended to eight additional Gulf Coast counties (Figure 2.2). Including Refugio County, a total of 493 wells was selected for analysis as possible pre-67 abandoned wells in the nine counties. Table 3.11 summarizes the pre-67 abandoned well study results for the combined nine counties. Table 3.11 shows that 50 of the original 493 wells were determined to not be pre-67 abandonments. Of the remaining 443 possible pre-67 abandonments, Forms 4 were found for 362 wells but no abandonment data were found in the TRRC files for 81 of the wells. Those 81 wells are of possible concern in that their status and mechanical condition are unknown and they might, if in an AOR, require corrective action to meet UIC requirements.

It is believed, based on the Texas Permian Basin study and this study, that the only wells that would be likely to raise any TRRC concerns in AOR studies in the Texas Gulf Coast area will be in the pre-67 abandoned well population. The results described above show that TRRC file data are lacking for some percentage of that group of wells, about 18% in this study. Thus, well construction and abandonment characteristics of the majority of all wells would be such that AOR variances could be considered for Gulf Coast injection wells but a population of pre-67 abandoned wells exists that could preclude such variances. The next section (Section 3.5) describes the existence of mitigating geological circumstances that could ameliorate concerns about those pre-67 abandoned wells the status and mechanical condition of which are uncertain.

**3.5 Mitigating Geological Circumstances**

As discussed in Section 2.1.3.4, a possible basis for AOR variance is the availability of geologic conditions that preclude upward fluid movement through a pathway, such as an unplugged or inadequately plugged abandoned well. Section 3.1 discusses the geology and hydrogeology of the Texas

Gulf Coast and, within that section, sub-Section 3.2.5 points out the general availability of both sloughing and squeezing shales* for closure of boreholes and normally pressured sands to act as sinks for any upward flowing formation water.

### 3.5.1 Sloughing and Squeezing Shales

Some shales and some other types of sedimentary rocks exhibit a tendency to slough or cave into a borehole, thus acting as a naturally occurring plug. In other cases the shales expand and squeeze the borehole shut. Both effects can also occur behind the casing of a cased borehole to fill or close the behind-casing annulus.

#### *3.5.1.1 General Availability in Study Area*

Sub-Section 3.2.5.1 discusses the general availability of sloughing and squeezing shales in the Gulf Coast study area. Such shales occur throughout the Texas Gulf coast, interbedded with sands, from the ground surface to very great depths below the surface. More specifically, they are ubiquitously present in the depth interval of from a few hundred feet below the ground surface to about 4,000 feet which is the interval where they would be needed to close off any open boreholes between the base of the deepest usable quality water (UQW) and the top of the shallowest injection zone. While this general shale presence is well known, it must be demonstrated that the locations and amounts of shale are present in individual oilfields to satisfy criteria for those characteristics.

#### *3.5.1.2 Specific Availability in Study Fields*

To test the availability of sloughing and squeezing shales for AOR purposes in specific individual oilfields, criteria for their location and thickness must first be established. In consultation with the TRRC, two thickness criteria were established.

1. A cumulative thickness of 250 feet.
2. A continuous thickness in one shale unit of 100 feet.

**Througout this section, the term shale is used whereas, as discussed in Sections 1.3.1 and 3.2, these deposits are probably Miocene-Pliocene age fluvial and lagoonal mudstones.*

In addition to these two criteria, in analyzing borehole geophysical logs, only shale units of >20 feet in thickness were counted toward the cumulative 250 feet and sandstone units of >10 feet in thickness were counted as breaks when cumulating the 250 feet of thickness and in locating the 100 feet of continuous shale.

To determine where in the vertical geologic column the shale units needed to be, the TRRC UIC computer data base was analyzed to show the deepest permitted base of usable quality groundwater in each analyzed oilfield. These data are contained in the computer printouts in Appendix 1. For example, in the Tom O'Connor oilfield in Refugio County, the deepest base of UQW is 1500 feet. This value which comes from the Refugio County printout in Appendix 1 is shown in data Column 1 of Tables 3.21-3.29, which summarize these and other data items for all study oilfields, as extracted from Appendix 1 and from analysis of the well logs in Appendix 2.

After establishing the deepest base of UQW in each oilfield, the well logs shown in Appendix 2 were used to establish the presence and location of the 250 feet cumulative and 100 feet continuous shale intervals in the fields.

The logs in Appendix 2 were obtained from Cambe Geological Services, Houston, Texas. The logs were selected to begin at depths above the deepest base of UQW, if possible. They were also selected to have a suite of electric logs that could be interpreted to distinguish the shale/sand strata in the depth interval of interest.

After preliminary investigation of available logs in the Cambe log library, it was decided to use only a single log that could be found to meet or nearly meet these criteria. This was because such logs proved to be scarce and because it was found that the necessary shales were present in every usable log that was examined. The principal problems of log selection were:

1. Very few, in some fields no, usable logs could be found that extend upward to the base of deepest UQW.

2. Because of the age of fields and for other reasons, the logs that are available often do not have the desirable combinations of good-quality electric logs necessary for the shale/sand interpretation in the transition zone from fresh to saline water.

Because a single log was selected for each oilfield, there is no assurance that the detailed location of the shale intervals in the borehole as interpreted from that log are representative of the entire field. However, the occurrence of shale intervals that meet the established criteria of 250 feet cumulative thickness and 100 feet continuous thickness in every oilfield and in every usable log studied is considered to be compelling evidence that such shale is present throughout the Gulf Coast study area within the stratigraphic interval of interest.

As shown in Tables 3.21, 3.22 and 3.23, no log interpretation was done for oilfields that had been identified as shallow piercement dome oilfields these fields were excluded because their geology was considered to be too complex, as discussed in Section 3.2.4.3.1, to allow any generalization of the presence and location of sloughing or squeezing shale intervals throughout the field. Such fields are probably not amenable, on a field-wide basis, to AOR variance based on geologic conditions.

In addition to the deepest base of usable quality groundwater, which appears in Column 1 of Tables 3.21 - 3.29, these tables show:

Column 2 - The shallowest permitted top of injection for any UIC database well in the field.
Column 3 - The shallowest permitted top of injection for any active UIC database well in the field.
Column 4 - The base of the shale isolation section from the field log in Appendix 2.
Column 5 - The total thickness of interval from the base of usable quality groundwater to the base of the shale isolation section. This value is not given where the field log of Appendix 2 did not extend to the base of usable quality groundwater.
Column 6 - Column 5 divided by the actual amount (feet) of shale in the total Column 5 interval as shown in the field logs of Appendix 2.

The data in Table 3.26 will be interpreted for Refugio County to exemplify their significance and application. For Refugio County, Table 3.26 shows that the deepest base of usable quality groundwater ranges from a minimum depth of 1200 feet in two fields to a maximum of 1650 feet in the Greta field. This is a rather uniform maximum depth throughout the county. Within the individual fields the range throughout the field is also not great. For example, in the Tom O'Connor field, the field data sheets in Appendix 1 show the Base UQW ranging from a minimum depth of 1200 feet to the maximum depth shown in Table 3.26 of 1500 feet. The maximum depths of Table 3.26, Column 1, were selected to represent the most conservative known depth from which to begin the analysis of the logs in Appendix 2.

The Column 2 and Column 3 values in Table 3.26 are shown to indicate the shallowest depth at which the TRRC database shows injection to have been permitted for any well in the database (Column 2) and the shallowest depth at which any active UIC database well is permitted to inject (Column 3). These values help to put into perspective the depth of the base of the shale isolation interval in Column 4. For example, in the Tom O'Connor field, the base of the shale isolation interval is at a depth of 2080 feet. Since no injection is currently permitted above a depth of 2950 feet, it would pose no restriction on current actual practice if a variance stipulation for that field was that injection must be below a depth of, for example, 2500 feet. Even if a depth of 3000 feet were selected as the minimum for injection it would be largely consistent with current practice in that only one active injection well in the UIC database is shown to be permitted to inject at at a depth of less than 3000 feet.

The logic in suggesting that a minimum depth for injection in an AOR variance scenario be greater than the base of the shale isolation intervals shown in Tables 3.21 - 3.29, Column 4, is that, as previously discussed, the shale isolation interval location is based on a single well log from each field and some variation in the location of that interval will occur throughout the field.

Column 5 of Table 3.26 gives the total thickness of stratigraphic interval that was needed to obtain the 250 feet cumulative and 100 feet continuous shale intervals required to meet the criteria discussed earlier in this section. Column 6 of Table 3.26 gives the Column 5 value divided by the actual thickness of shale within the total interval. The resulting ratio is an indication of the amount of shale v. the total interval. For example, in the Tom O'Connor field the ratio of Column 6, Table 3.26 is 2.32. This means that, within the overall 580 feet interval, there is slightly more sand than shale (1.32 feet of sand for each 1.0 feet of shale). However, for all of Refugio County, based on the results of one well in each of nine fields, the average ratio is very close to 2, showing an approximately equal occurrence of sand and shale. The significance of this is that, if the total isolation interval in Refugio County fields were, for example, to be arbitrarily doubled, this should also approximately double the amount of shale present to provide borehole closure. This is also true, on average, for all of the counties studied, as a group.

In the specific case of the Tom O'Connor field, if the base of the shale isolation interval were to be extended to a depth of 3000 feet, as previously discussed, this should result in an approximate total cumulative shale thickness of 500 feet, twice the minimum criterion of 250 feet [(3000 - Column 1) x (2) = 500]. This process is suggested as a conservative means of compensating for the lack of field-wide studies of shale occurrence while, at the same time, imposing no undue restriction on actual injection practice. Obviously, the general concept will need to be applied thoughtfully, field-by-field, using the type of data presented in Table 3.26.

***3.5.1.3 Evidence of Effectiveness***

Early evidence of the presence of the presence of sloughing and squeezing shales and their effectiveness for borehole closure in the Texas Gulf Coast was reported by Frost[25] who summarized information available to him in 1938 concerning the problem of drilling through "heaving" shales in that geologic province. Frost[25] avoided defining a "heaving" shale but reported that; "In the work of certain companies, if a formation could be drilled through finally it was not reported as a heaving shale, but if the company was forced to stop drilling operations because of shale heaving in the hole, it was repored that the hole was abandoned due to heaving shale." It would seem that this extreme squeezing or "heaving" behavior is far beyond that required for closure of an abandoned borehole that needs only to be closed off over an extended period of time.

The "heaving" shale intervals and trends reported on by Frost[25] included shales of the Miocene age Largarto (Fleming) Formation. Details of the heaving shale occurrences in individual fields were described in 1938 Gulf Coast field summaries by Leyendecker[26]. Those field summaries showed that the "heaving" shale intervals were generally at depths below 3000 feet. This is possibly because the extremely rapid borehole closure that was considered "heaving" required overburden pressures that are present below 3000 feet. It would be expected that such shales would also close-off an open borehole at shallower depths, but more slowly.

The principal evidence for the effectiveness of Texas Gulf Coast shales in closing an open borehole comes from a 1991 study conducted by the E.I. du Pont de Nemours Company (Appendix 3) at a site near

Orangefield, Orange County, Texas. The study was conducted to show that, in the study area, an open borehole will be naturally sealed by squeezing shales within a very short period of time. In the DuPont study, closure of the test borehole within one week was demonstrated to occur.

The shale section that was the subject of the DuPont test was the same Miocene age Fleming Group that is of interest in this study. The interval that caused the borehole closure during the DuPont test was at a depth of from 2838 feet to 2926 feet (88 feet) or roughly the same depth range and minimum continuous thickness of shale being suggested for borehole closure purposes in this study.

***3.5.1.4 Examples of Concept in Selected Wells***

Figures 3.39 - 3.43 depict typical wellbores for pre-67 Gulf Coast wells for which abandonment data were not found. Thus, they are wellbores for which the availability of properly located sloughing and squeezing shales, combined with the only known wellbore features, could be the basis for AOR variance consideration.

Figure 3.39 is the wellbore schematic drawing of a typical dry hole, where surface casing was set but with no production casing. For this well, no casing cement data were reported, so no cement is shown. The surface casing was set at a depth of 800 feet, above the deepest base of usable quality groundwater (UQW) at a depth of 1500 feet. Thus, based on the available information the wellbore contains no barriers to prevent flow from the shallowest reported top of active injection (Table 3.26) to the deepest UQW base.

The Tom O'Connor field well log in Appendix 2 is the source for the squeezing shale interval depicted in Figure 3.39. As discussed earlier in Section 3.5.1.2, there are probably several hundred more feet of shale available between the base of the shale isolation interval shown in Figure 3.39 and the top of the shallowest active injection zone in the field.

The potential flow path and the number of barriers to flow from the injection zone to the UQW base can be evaluated visually, or the Automated Borehole Evaluation (ABE) program[3,4,5] can be used. The results of this evaluation are shown in Table 3.30, where wells are listed by field for all counties, including Refugio County, and for each field in increasing API number. For the M.F. Lambert well, API

#391-01350, the table shows that the available path is "TP" or through pipe (or through borehole) and that there is one barrier, which is a section of squeezing shale, that forms a plug. In the absence of the squeezing shale, there would be no firm basis for evaluating this well or others like it, since its status and wellbore condition are not completely known.

Figure 3.40 depicts an example very much like the first one except that casing cement was reported and is shown. However, since the surface casing is above the deepest UQW base. The casing and the cement provide no protection to the deepest UQW. The barrier evaluation scenario would be the same as for the first wellbore. That result is given in Table 3.30 which shows one TP barrier and one plug.

Figure 3.41 shows a borehole where surface casing does cover the deepest base of UQW and where cement data are available. In this case, Table 3.27 shows that there are three TP barriers (surface casing, surface casing cement and squeezing shale) and one plug (squeezing shale). There is one behind pipe or "BP" barrier (casing cement).

The example of Figure 3.42 is for a borehole with both surface casing and production casing. No cement data were found and, therefore, no behind-casing cement is shown for either casing string. Flow paths could be present from the shallowest injection zone either behind the production casing or through the borehole inside the production casing. The squeezing shale provides one BP barrier and the casing provides one TP barrier (Table 3.30).

In the example of Figure 3.43, both surface and production casing are present and cement data were available for both casing strings. Because of the production casing cement, the only available flowpath from the shallowest injection zone to the deepest base of UQW is behind casing. The squeezing shale interval provides one BP barrier and the TP analysis is not applicable, since there is no TP flowpath (Table 3.30).

### *3.5.1.5. Overall Probable Effectiveness in Study Area*

Specific examples of the availability and basis for effectiveness of squeezing and sloughing shales are given in the previous section. Table 3.30 shows that squeezing shale flow barriers are considered to exist in all fields except for fields that are known or believed to be shallow or shallow-intermediate piercement salt dome fields. Those shallow to shallow-intermediate salt domes that were not identified to be variance candidates can be distinguished in Table 3.21, 3.22, and 3.23 by the "na" or not applicable comment shown in the base of shale isolation interval column (Column 4). This "na" comment applies to seven fields in Brazoria County, three fields in Chambers County, and all six fields in Hardin County. All of the remaining fields (73-16=57) are believed to have the prerequisite squeezing shales. Such shales should also be present in all other non-salt dome fields or deep salt dome fields in other Gulf Coast counties within the Frio production trend identified in Section 3.2.

3.5.2 Sink Zones

Porous and permeable formations that are underpressured or normally pressured provide sink zones that can divert upward flowing fluids before the fluids can reach a UQW. The sands that are interbedded with squeezing shales, on an approximate one-to-one average basis in the study area, are normally pressured and constitute such sink zones. No detailed analysis of these zones is given because they are universally present and are considered to provide secondary protection, with the squeezing and sloughing shales being the more important source of protection for usable quality groundwater in pre-67 abandoned wells for which abandonment information is not available.

### 3.6 Extension of Study Results Within the Frio Formation Producing Trend

It is believed that the study results that have been previously described can probably be extended to all oilfields producing from the Frio Formation and deeper formations within the Frio producing trend that is shown in Figure 2.2. To facilitate this process, the UIC database for counties, other than the nine study counties, was searched for fields with five or more active permitted injection wells. The results of this search are contained in Appendix 4. As shown in Appendix 4, there are at least 78 additional fields in the 17 counties that were searched that contain 5 or more active UIC permitted injection wells.

### 3.7 AOR Variance Recommendation

Based upon the study results that have been described, it is recommended that field-by-field AOR variances be considered for oilfields within the area of the Texas Gulf Coast Frio Formation producing trend as shown in Figure 2.2. The basis for a variance for a particular field would be demonstration of the presence of prerequisite amounts of cumulative and continuous shale between the deepest base of usable quality groundwater and the injection zone to be permitted. The procedures for such demonstration have been developed and presented herein and have been successfully applied to 57 fields in eight counties. There are at least 78 additional fields in 17 other Frio producing trend counties to which the recommended procedures may apply.

## 4.0 CONCLUSION

A study has been conducted of 73 oilfields in 9 counties of the Texas Gulf Coast Frio Formation producing trend to evaluate the area of review variance opportunities for new injection wells in that oil producing trend.

During the study TRRC abandonment forms were found for all wells studied that were abandoned during and after 1967. Based on this result and the results of a pervious Permian Basin study, well construction and abandonment characteristics of the majority of all wells are such that AOR variances could be considered for Gulf Coast injection wells. However, abandonment data were not found for 18% of pre-67 abandoned wells. These wells, for which abandonment data were not located, are of possible concern in that their status and mechanical condition are unknown and they might, if in an AOR, require corrective action to meet UIC requirements.

To deal with the wells for which abandonment data were not found, the mitigating geological circumstances of sloughing and squeezing shales for borehole closure and of normally pressured sands to act as sinks for any upward flowing formation water were investigated.

Minimum criteria of 250 ft of cumulative shale and 100 ft of continuous shale were established. The necessary amount of shale and nearly equal average amounts of sand were found to be present below the base of the deepest usable quality groundwater and above the top of most permitted injection zones in 57 of the 73 injection fields that were investigated. The remaining 16 fields are shallow to shallow-intermediate depth salt dome fields for which this AOR variance procedure can probably not be applied field-wide.

It is concluded that field-by-field AOR variances can be considered for the Texas Gulf Coast Frio Formation producing trend based upon a combination of well construction and abandonment characteristics and the presence of mitigating geological circumstances. The study methods that produced this conclusion can probably be extended to at least an additional 78 fields in 17 other counties.

## 5.0 REFERENCES

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2. 40 CFR, Part 146, Subpart C, 146, 24.

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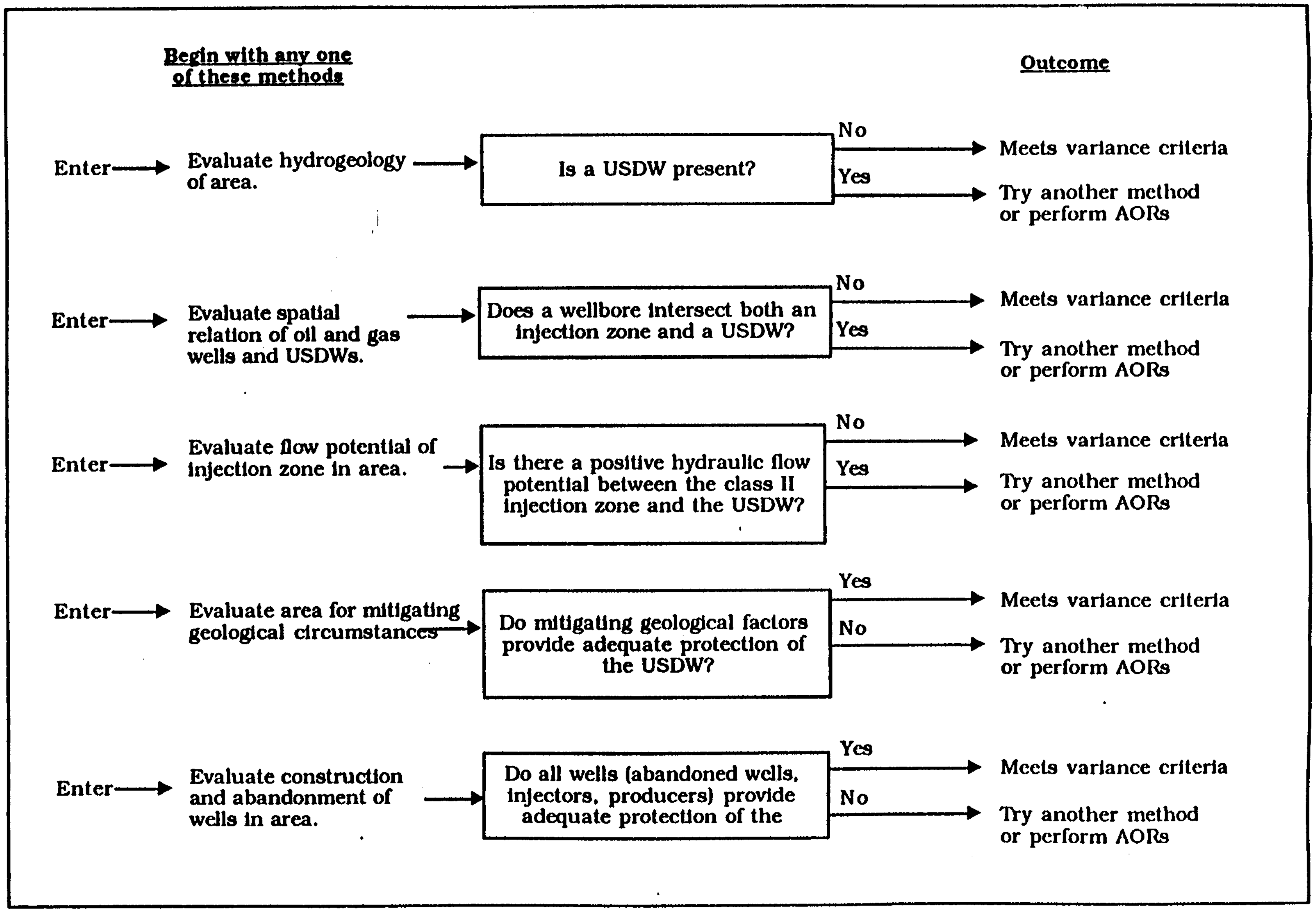



**Figure 2.1:** Five general methods are available for obtaining variance from revised EPA Area of Review requirements. These methods can be used in any order, singly or in combination, to exclude some or all wells from the AOR process. Wells not excluded by variance would be subject to well-by-well AORs.

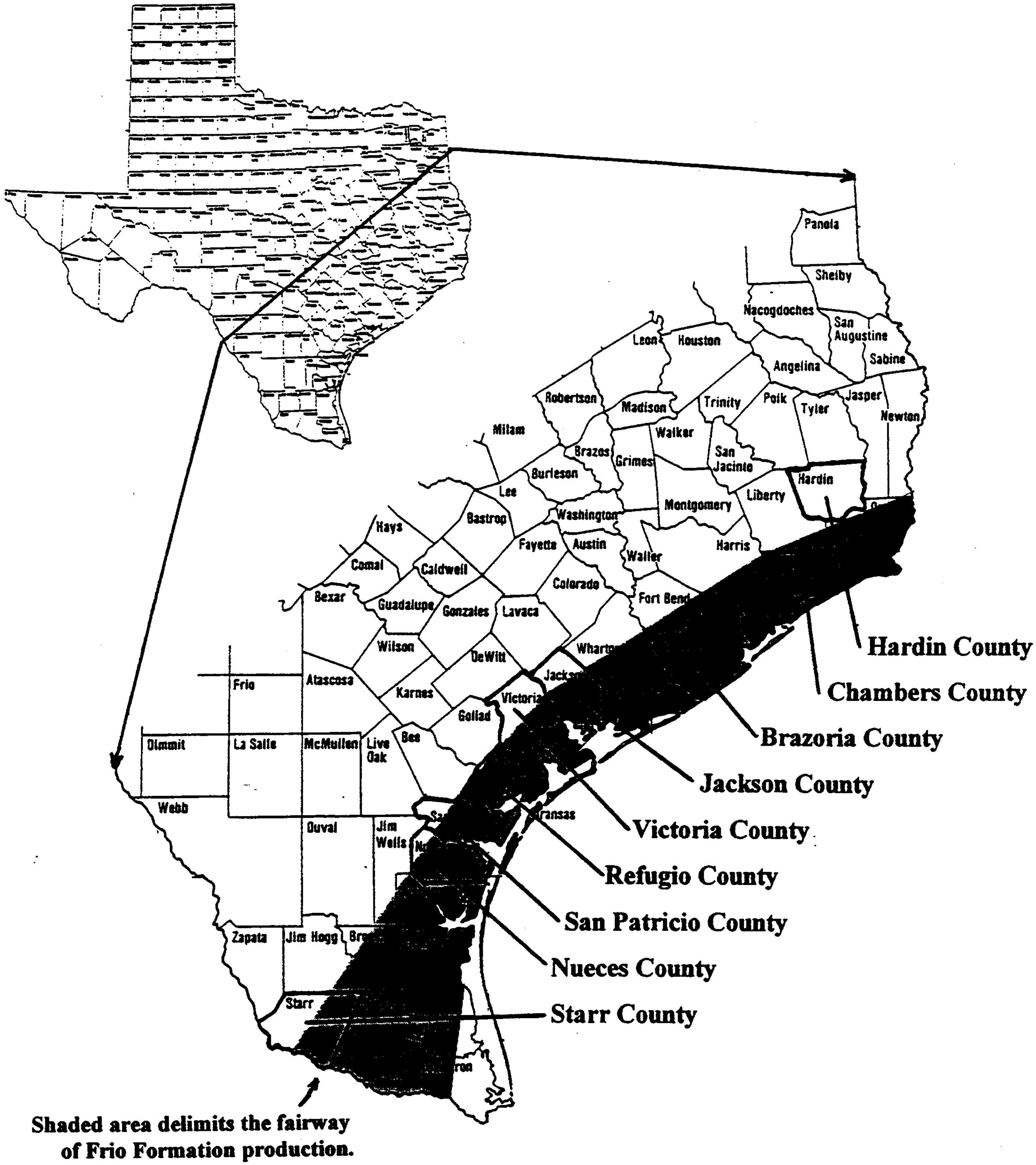



**Figure 2.2: Map showing Texas Gulf Coast Frio Formation producing trend and nine counties of this study.**

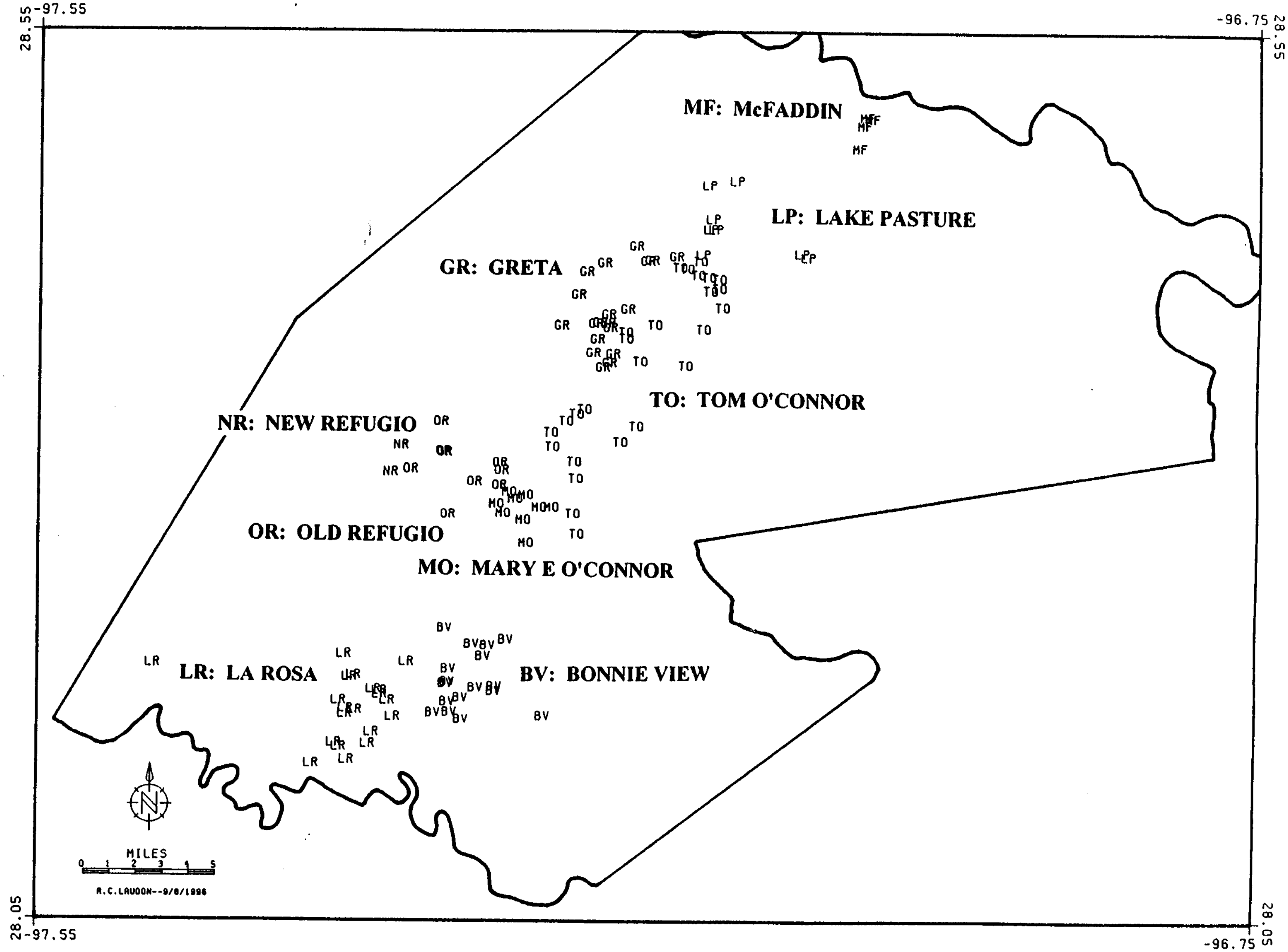



Figure 2.3: Map of Refugio County with locations of pre-67 abandoned wells. Data from Petroleum Information database.

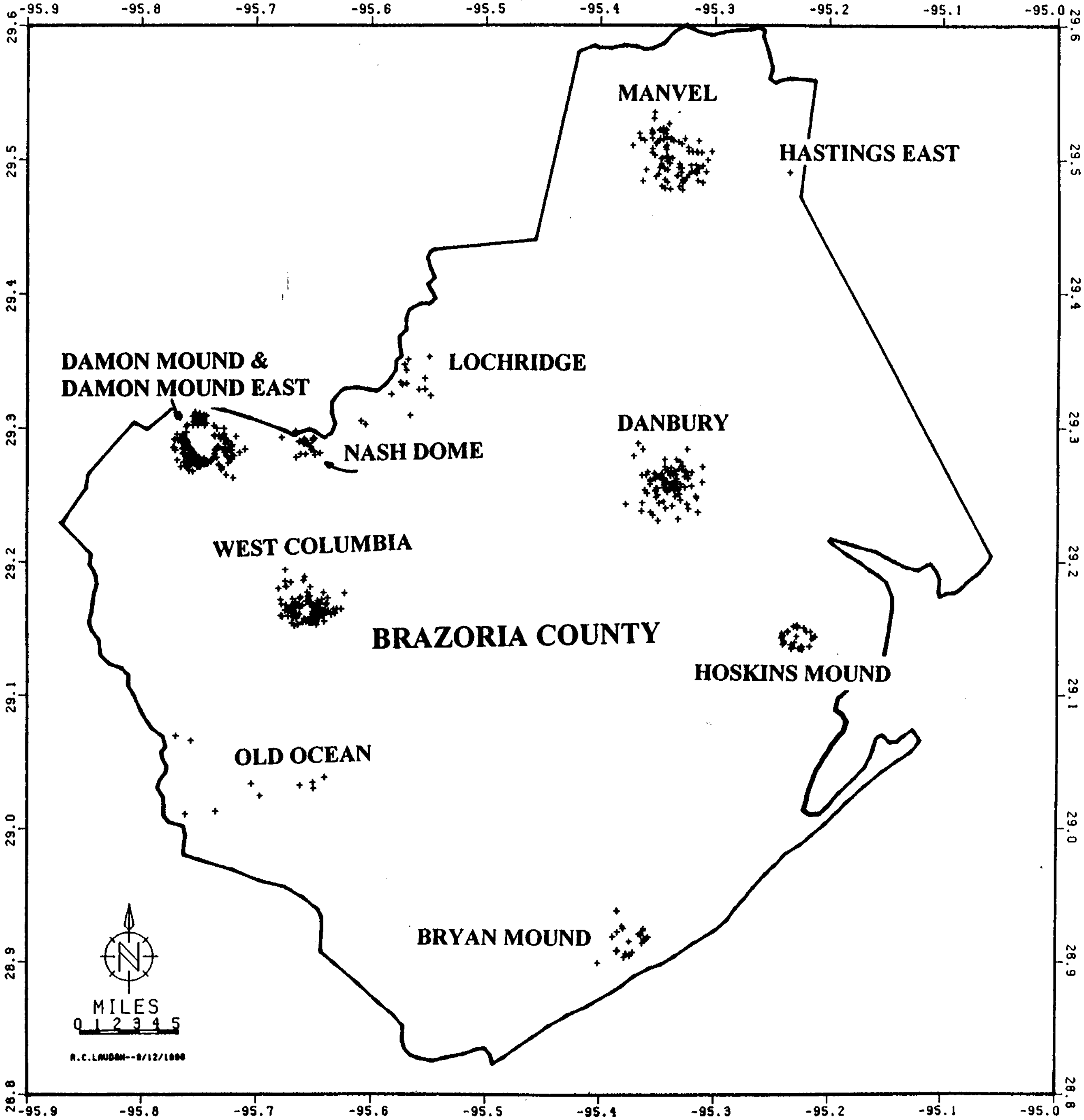



Figure 2.4: Map of Brazoria County showing abandoned well locations for fields included in this study. Data from Petroleum Information database.

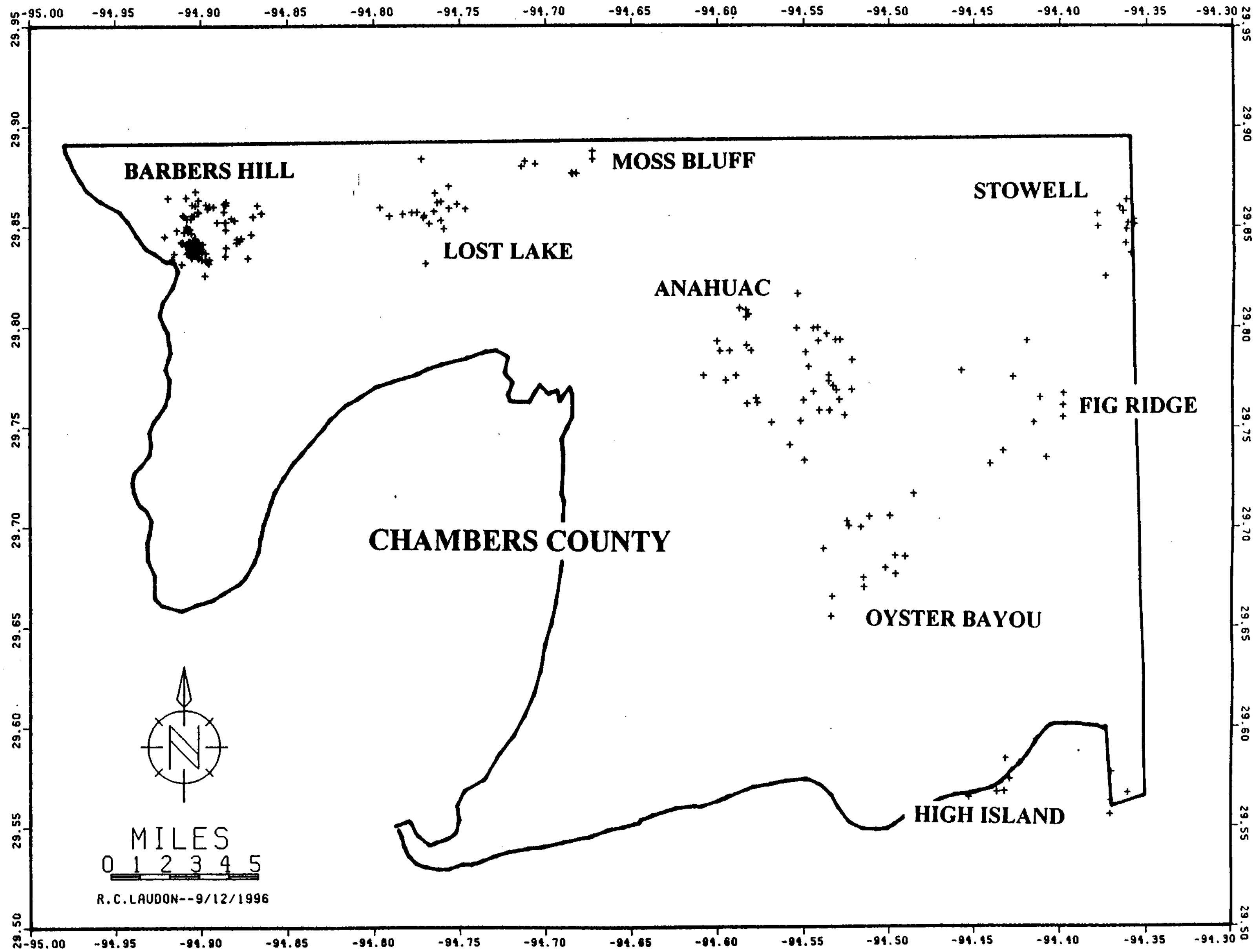



**Figure 2.5: Map of Chambers County showing abandoned well locations for fields included in this study. Data from Petroleum Information database.**

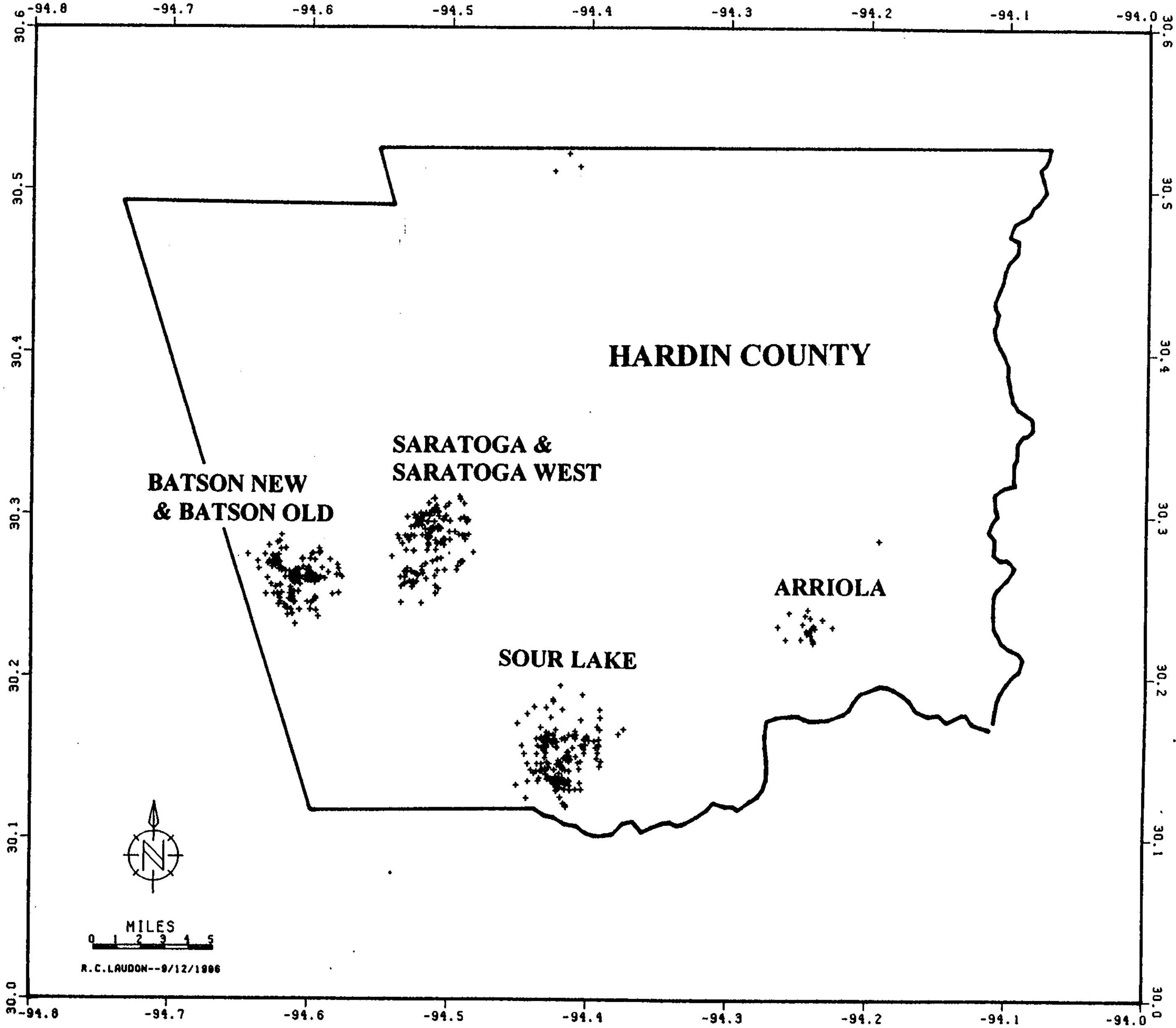



**Figure 2.6: Map of Hardin County showing abandoned well locations for fields included in this study. Data from Petroleum Information database.**

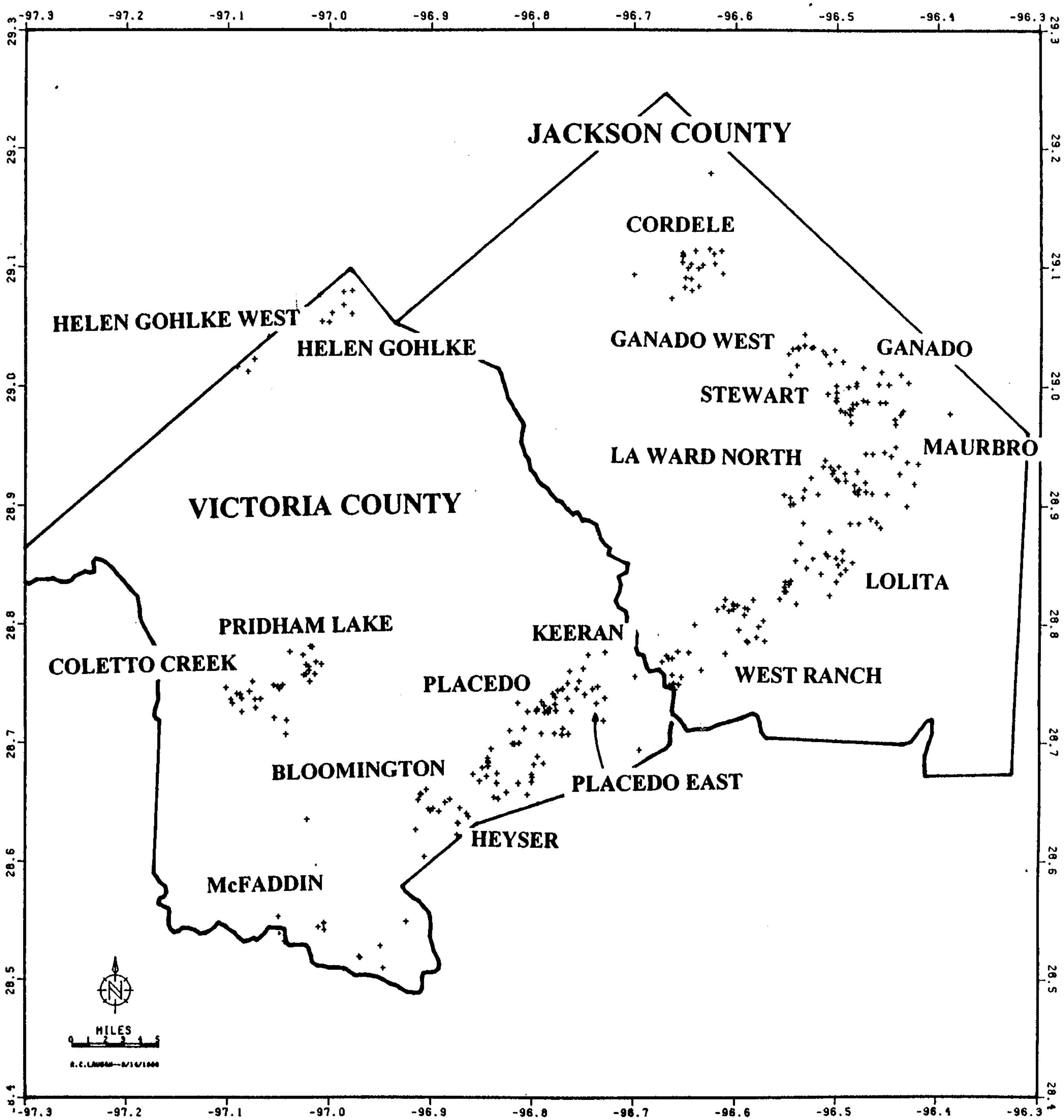



Figure 2.7: Map of Jackson and Victoria Counties showing abandoned well locations for fields included in this study. Data from Petroleum Information database.

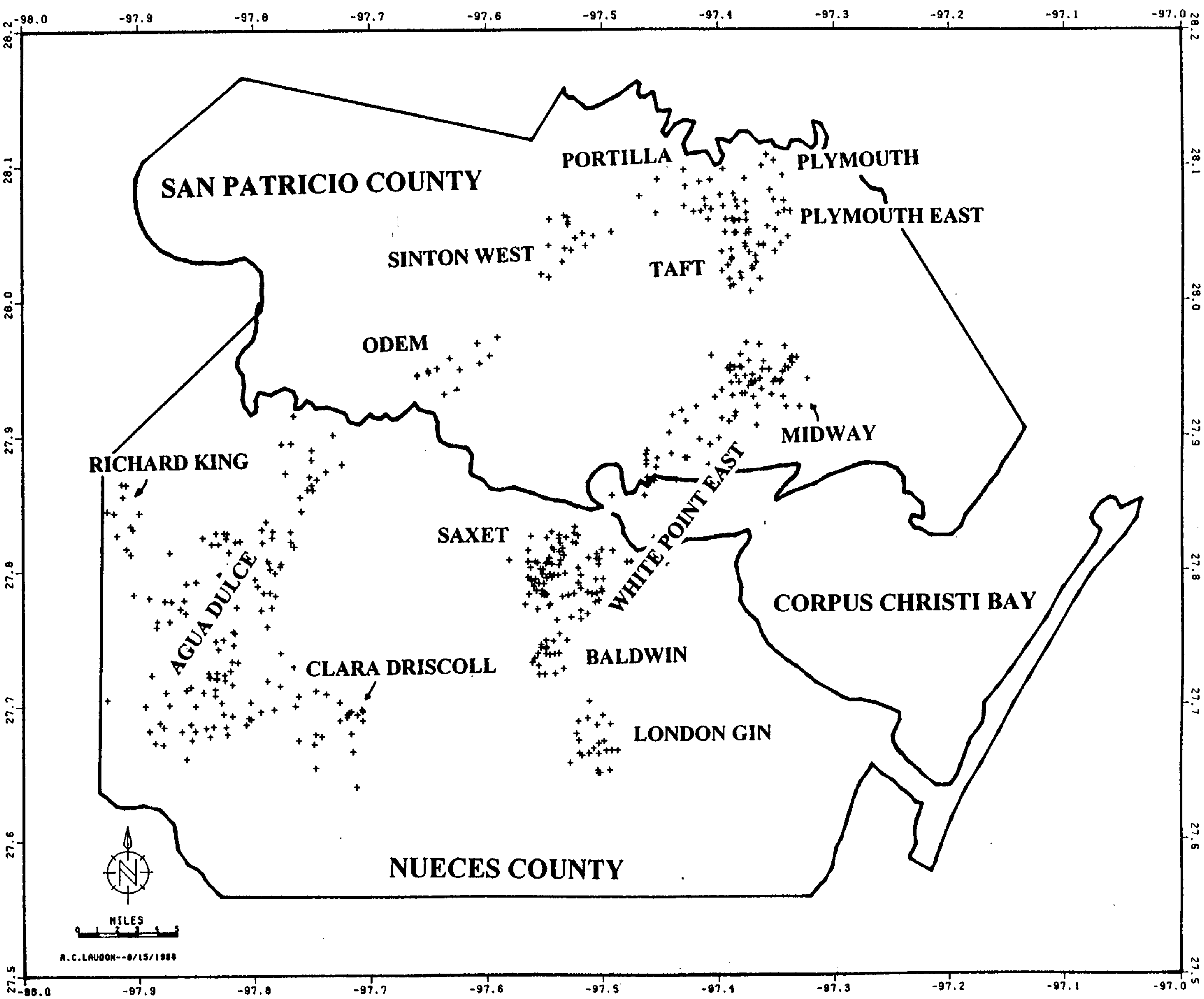



**Figure 2.8: Map of Nueces and San Patricio Counties showing abandoned well locations for fields included in this study. Data from Petroleum Information database.**

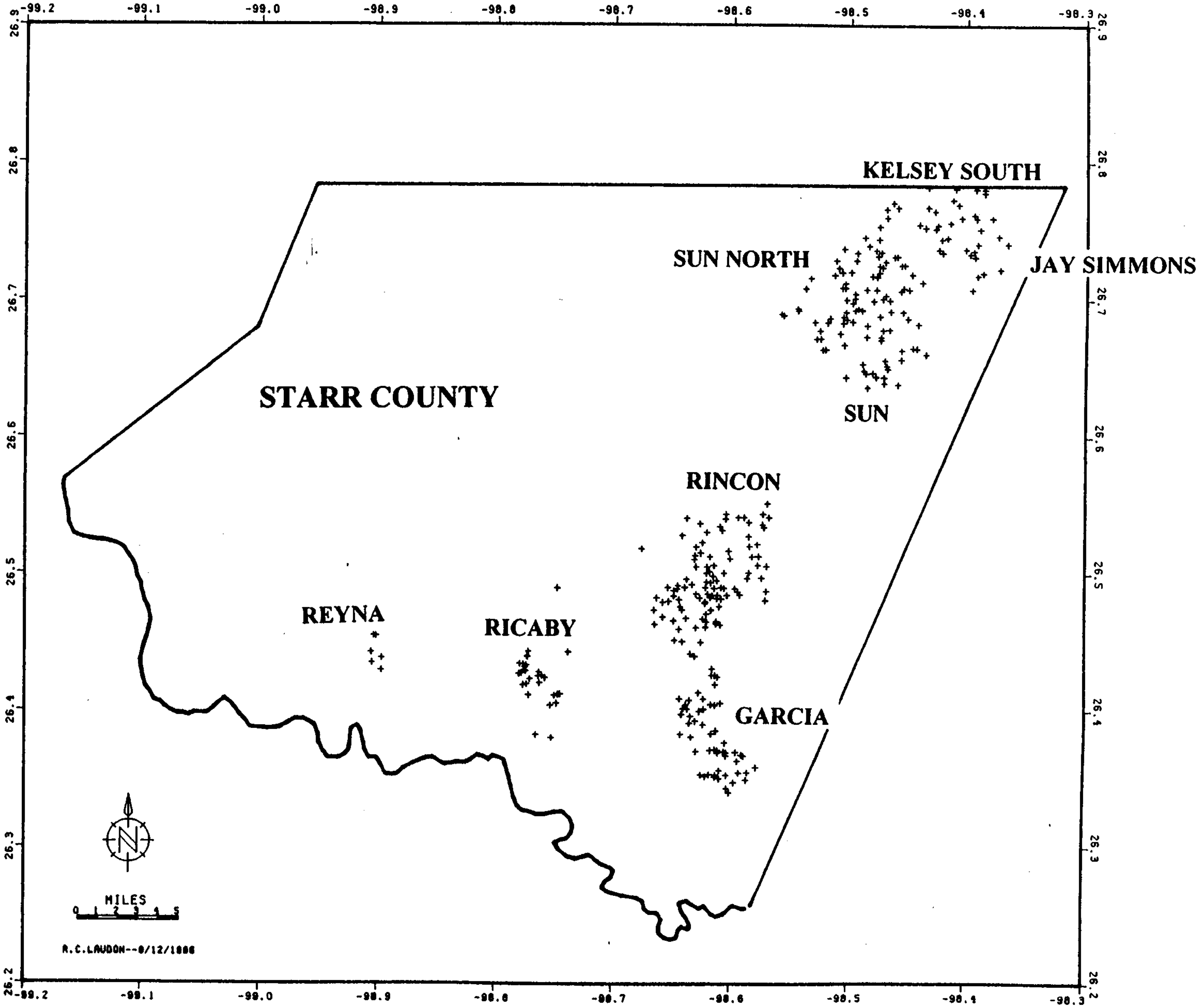



Figure 2.9: Map of Starr County showing abandoned well locations for fields included in this study. Data from Petroleum Information database.


**Figure 3.1: Map showing Texas Gulf Coast Frio Formation producing trend and Vicksburg and Frio fault trends.**

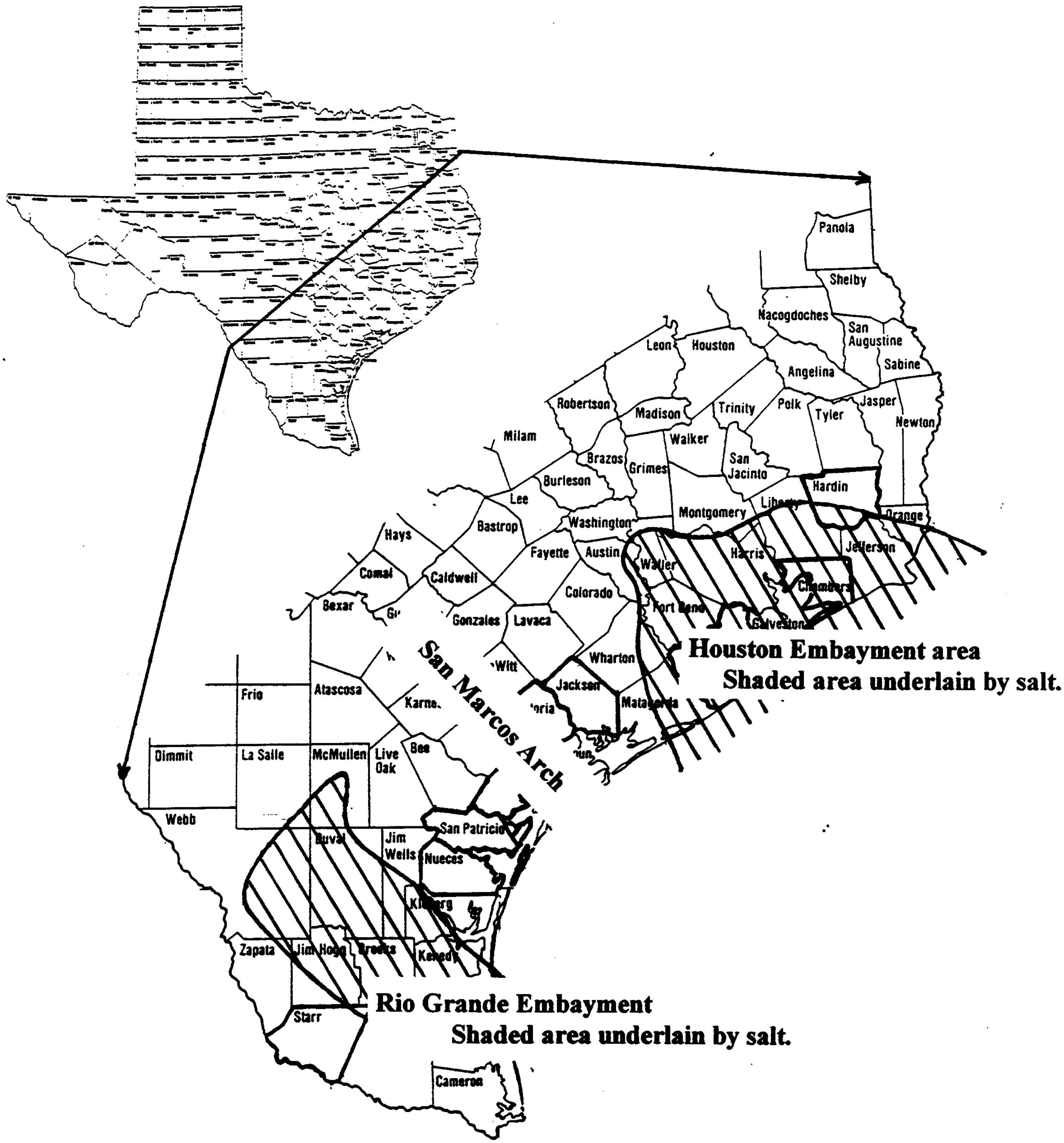



**Figure 3.2: Map showing three major structural elements of the Texas Gulf Coast.**

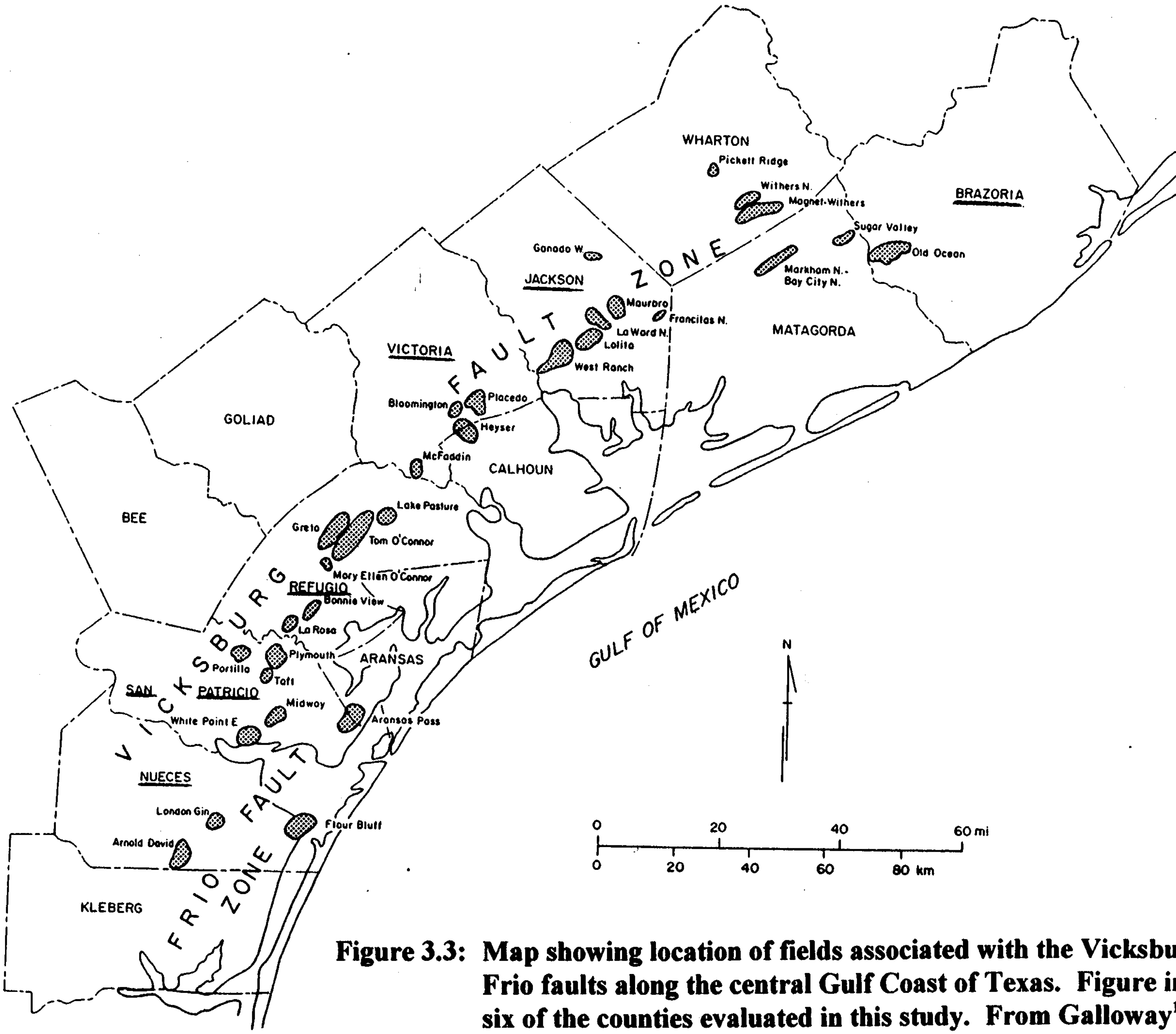



Figure 3.3: **Map showing location of fields associated with the Vicksburg and Frio faults along the central Gulf Coast of Texas. Figure includes six of the counties evaluated in this study. From Galloway[16].**

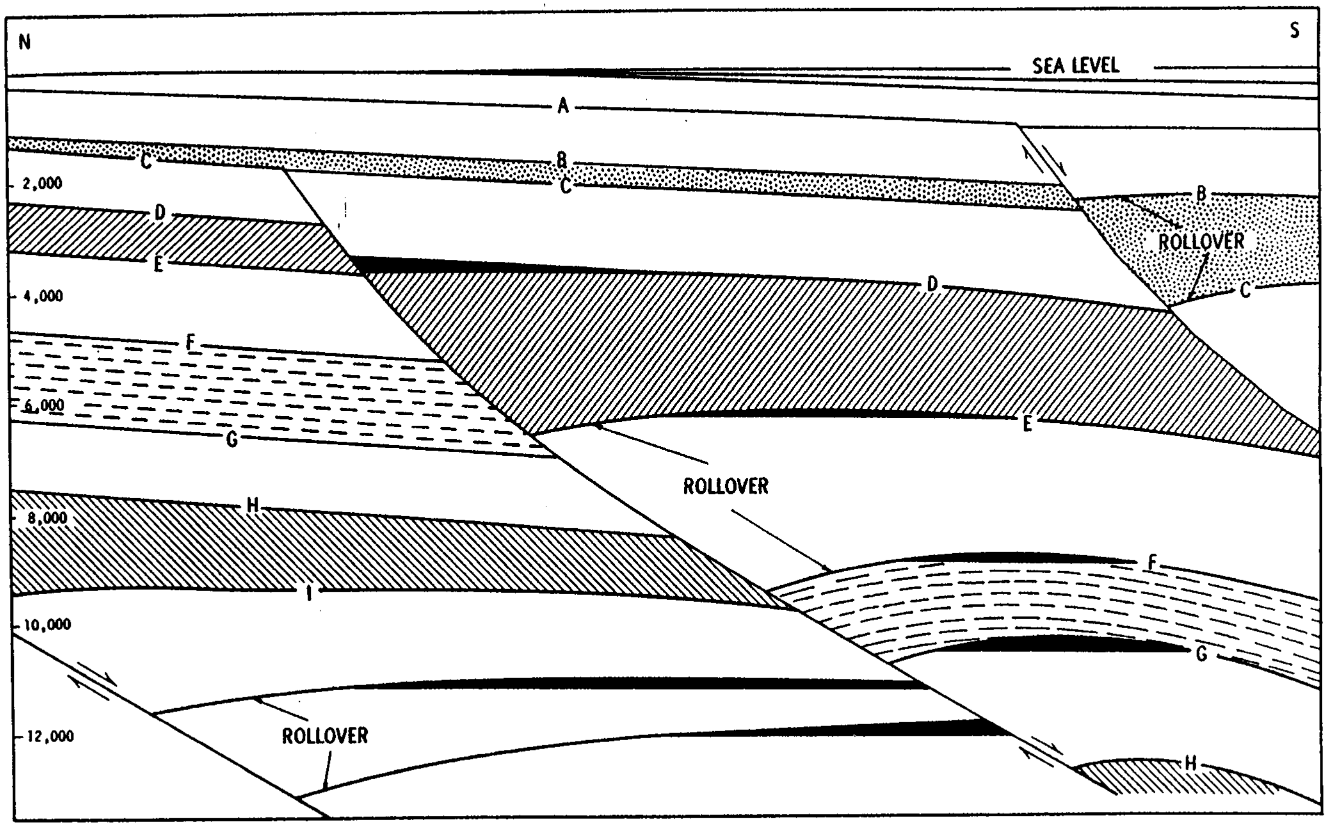



**Figure 3.4: Schematic cross section through a typical Gulf Coast growth fault. Note the rollover anticline (reverse drag) and the increase in stratigraphic thickness on the downthrown side of the fault. From Landes[15].**

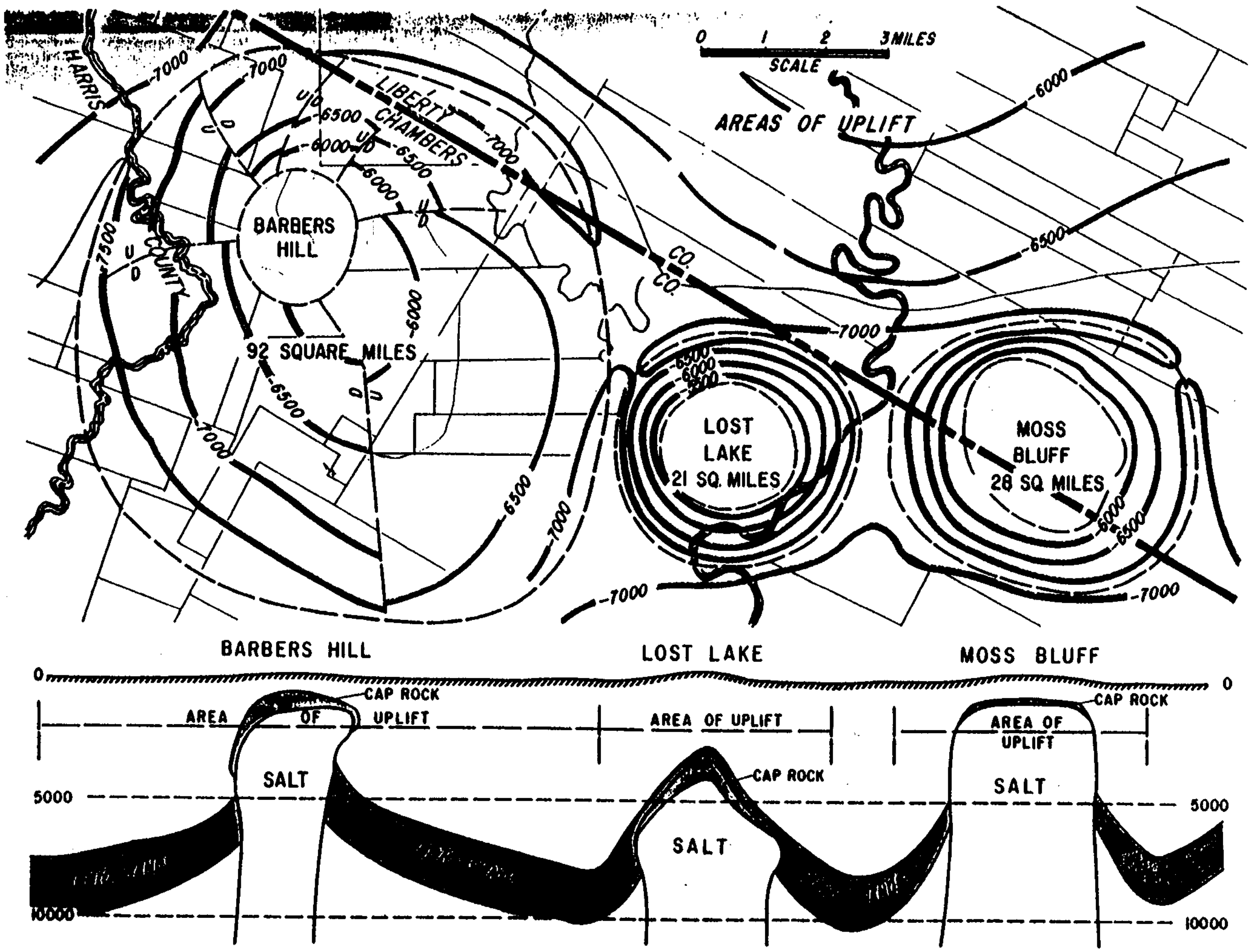



Figure 3.5: Structure contour map and cross section through Barbers Hill, Lost Lake and Moss Bluff salt domes, Chambers and Liberty Counties, Texas. From Halbouty[14].

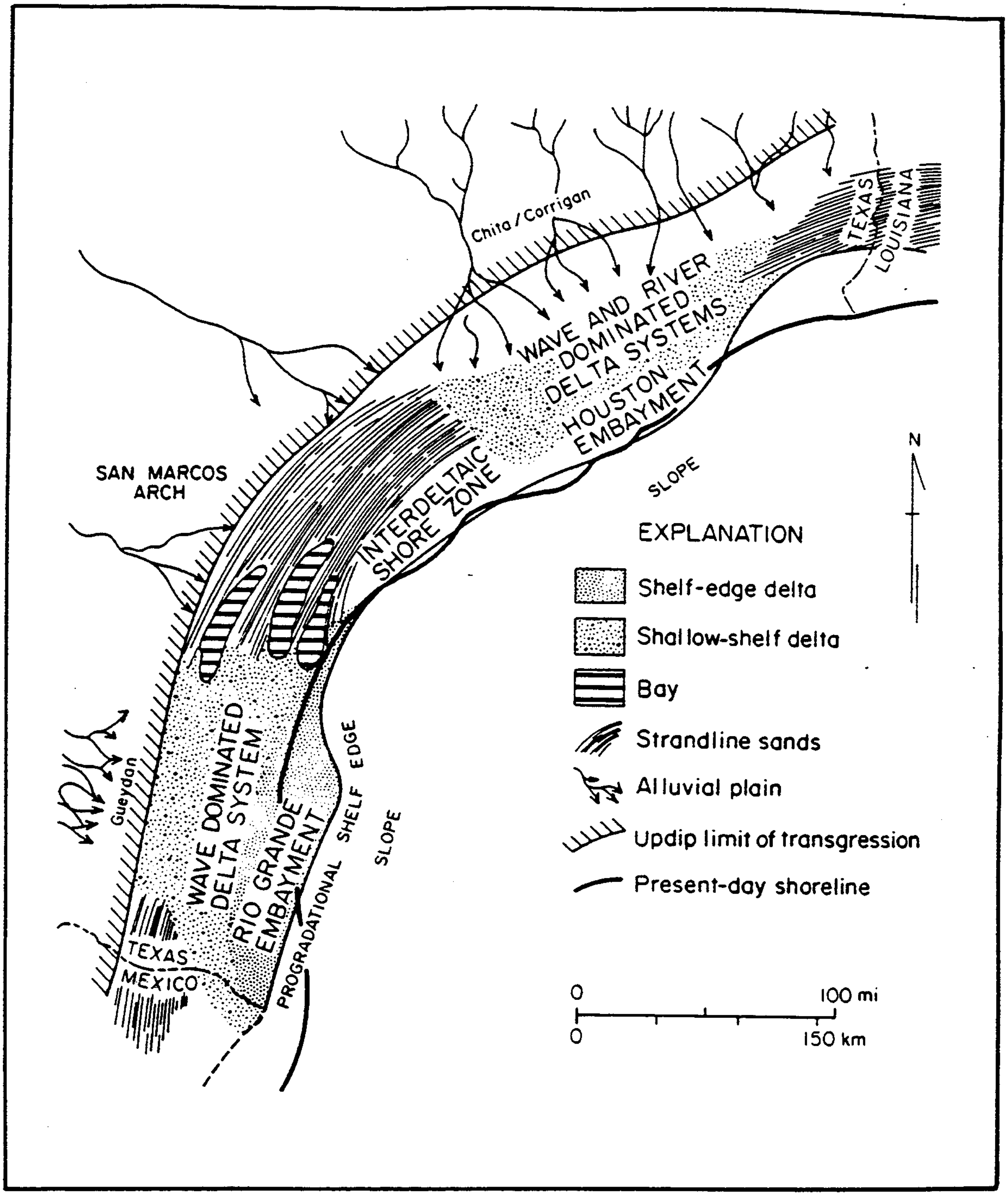



**Figure 3.6: Paleogeography of the Oligocene Frio Formation showing fluvial and delta systems in the Houston and Rio Grande Embayments, and barrier island/strand plain systems along the San Marcos arch. From Galloway[16].**

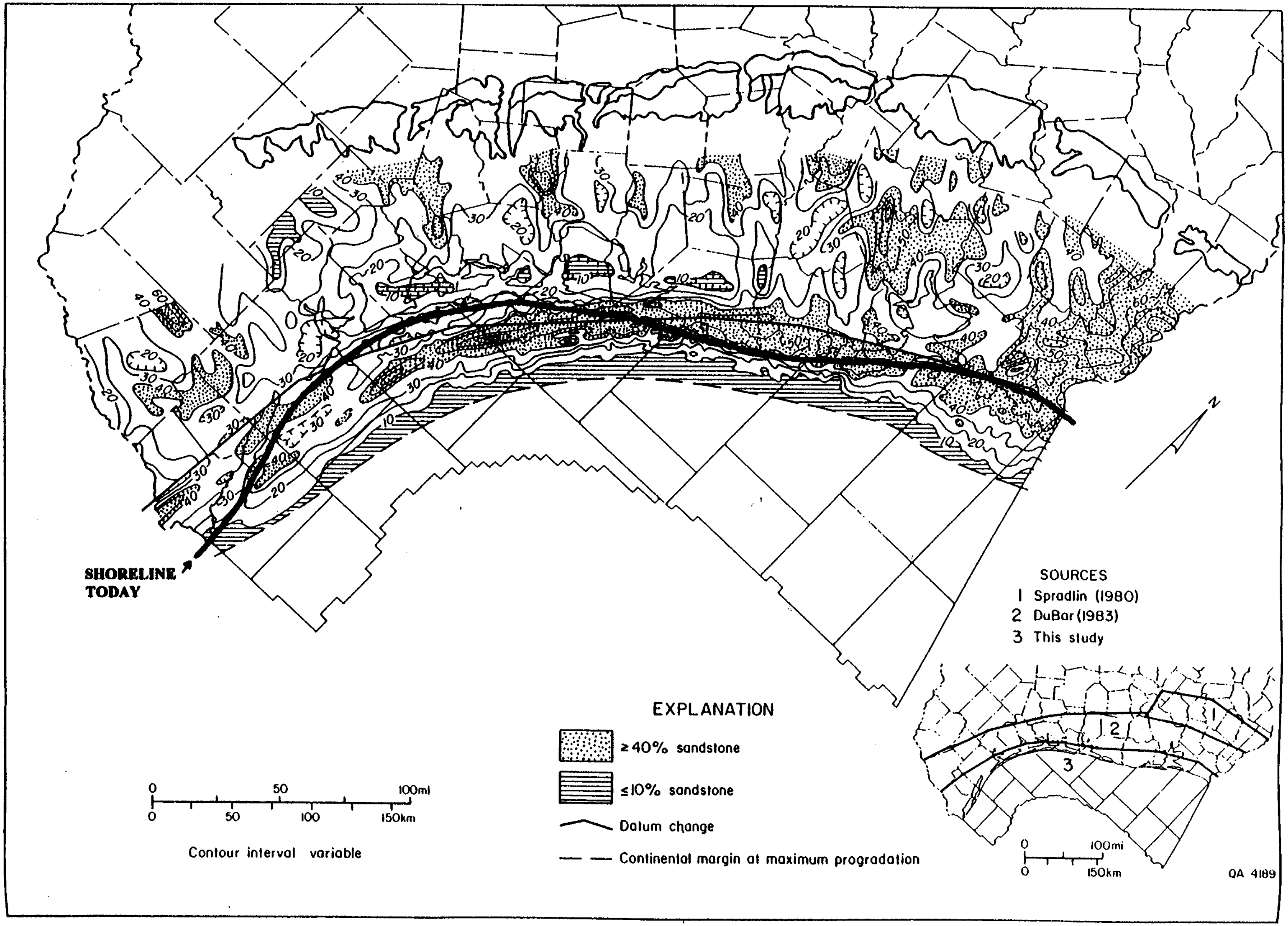



Figure 3.7: **Percent-sandstone map of the Lagarto Formation of the Lower Miocene Fleming Group. Note that the maximum onshore sandstone percentage is approximately 70 percent with an average of approximately 30 percent. Figure Modified from Galloway[23].**

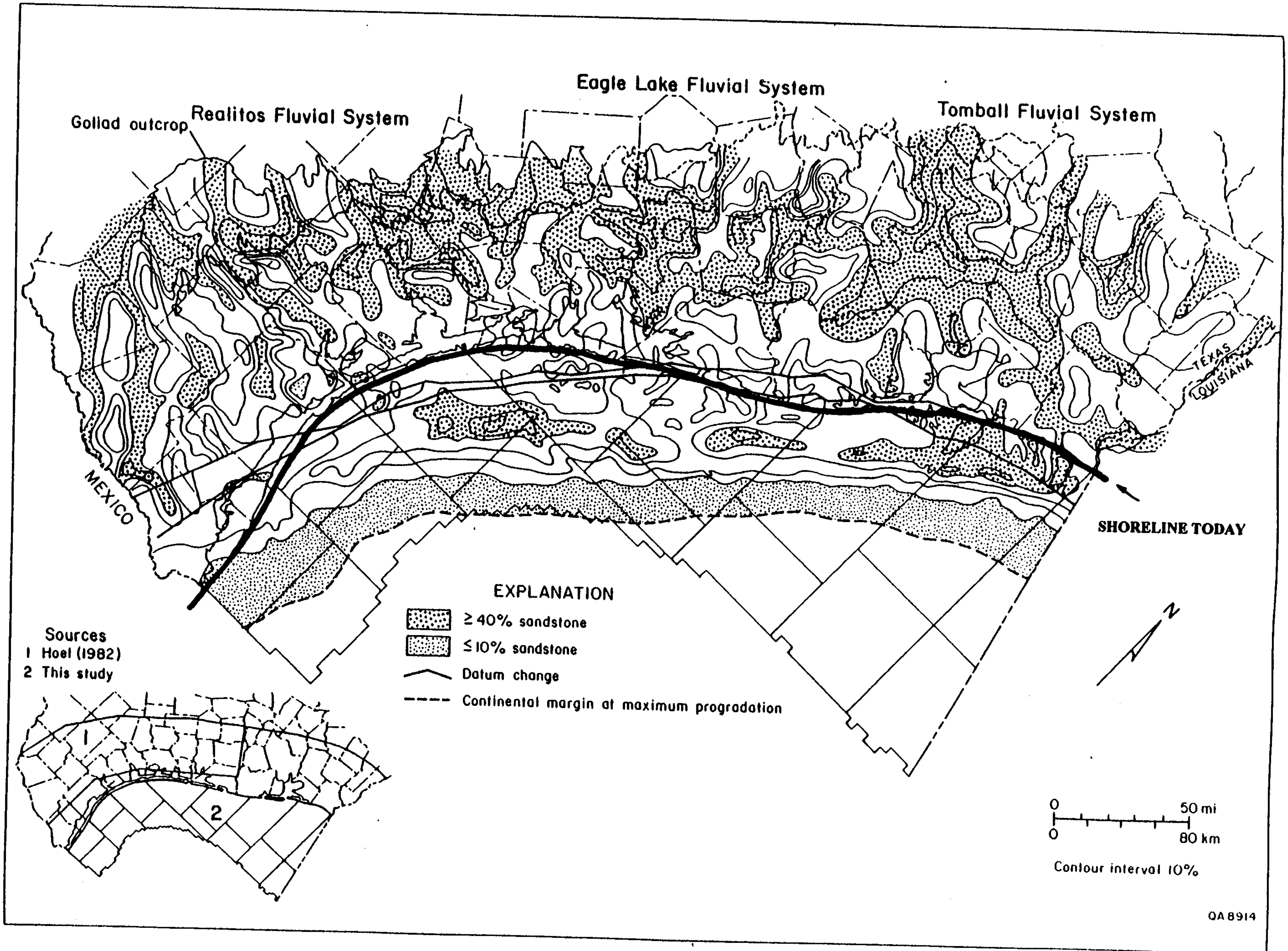



Figure 3.8: Composite percent-sandstone map of the middle-upper Miocene Goliad Formation. Note that the maximum onshore sandstone percentage is approximately 70 percent with an average of approximately 40 percent. Figure modified from Morton[24].

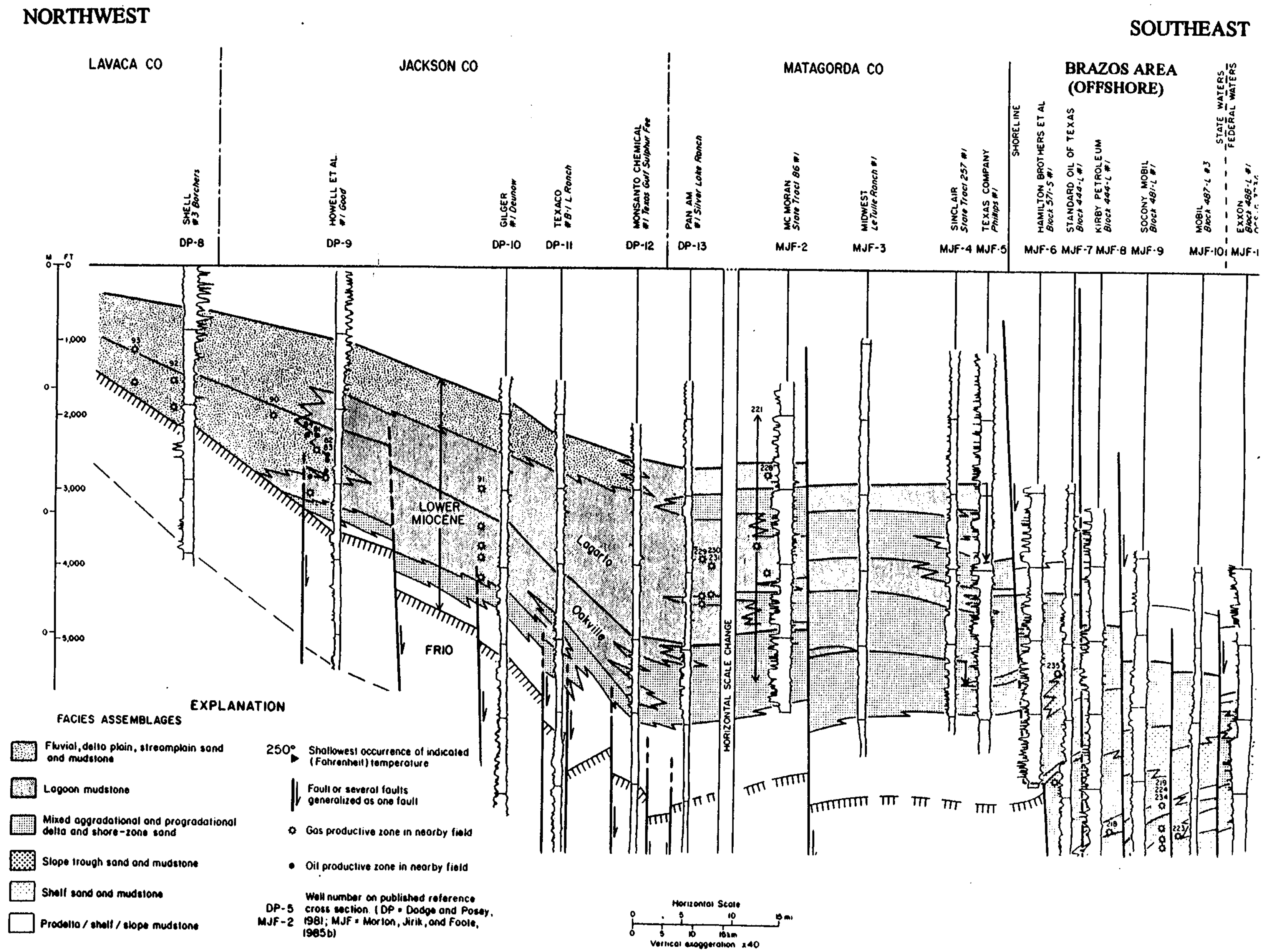



**Figure 3.9: Northwest-southeast cross section through the central Gulf Coast (Jackson County of this report) showing facies assemblages for the Oakville and Lagarto Formations of the Lower Miocene Fleming Group. From northwest to southeast, note the complex interfingering of sandy fluvial facies with muddy lagoonal facies with sandy delta and shoreface facies. Also note the salinity transition on the SP-Resisitivity logs on the two northwesterly logs. Figure modified from Galloway[23].**

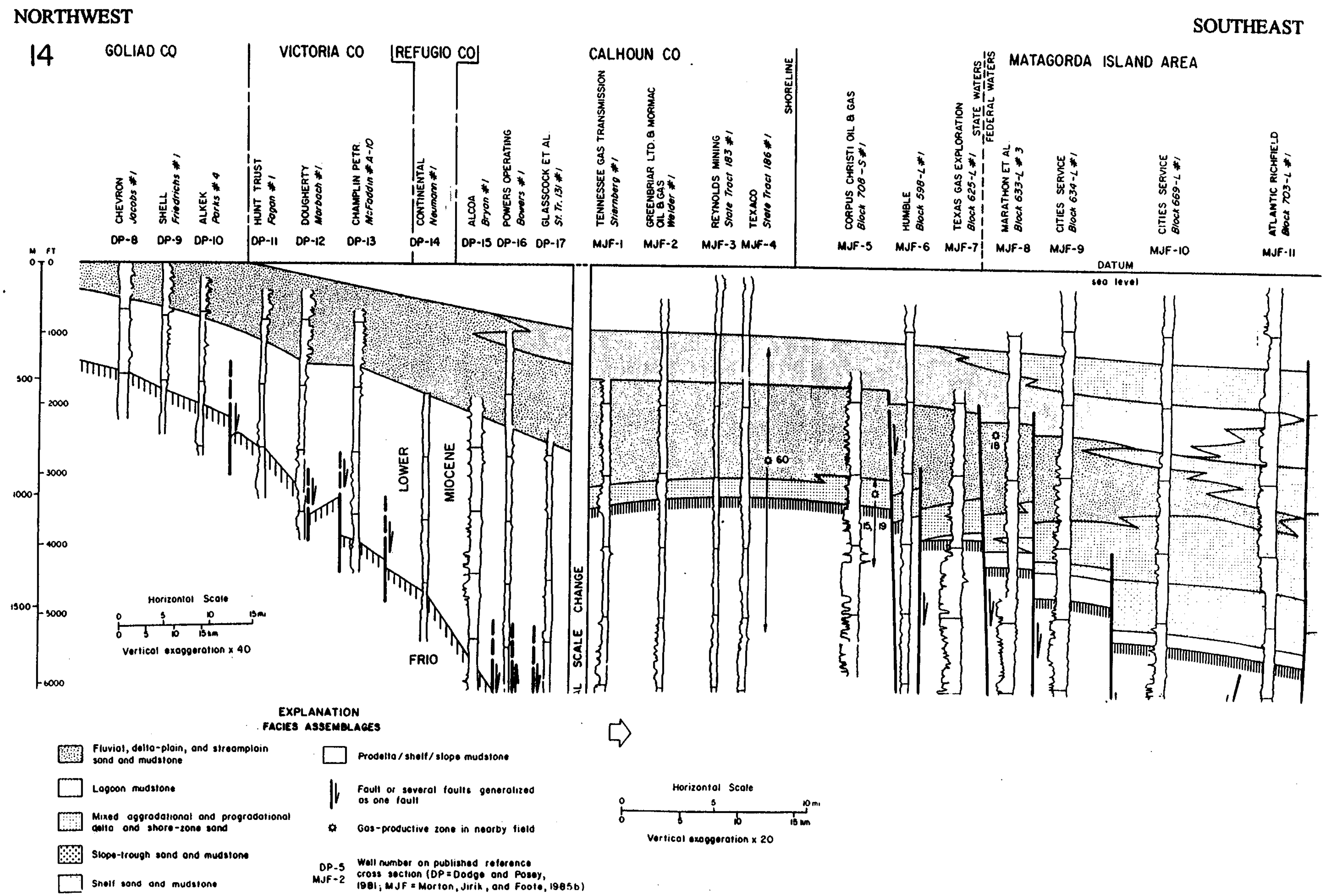



**Figure 3.10:** **Northwest-southeast cross section through the central Gulf Coast (Victoria and Refugio Counties of this report) showing facies assemblages for the Upper Miocene Goliad Formation. Note the downdip pinchout of sandy fluvial facies into muddy lagoonal and offshore facies. Figure modified from Morton[24].**

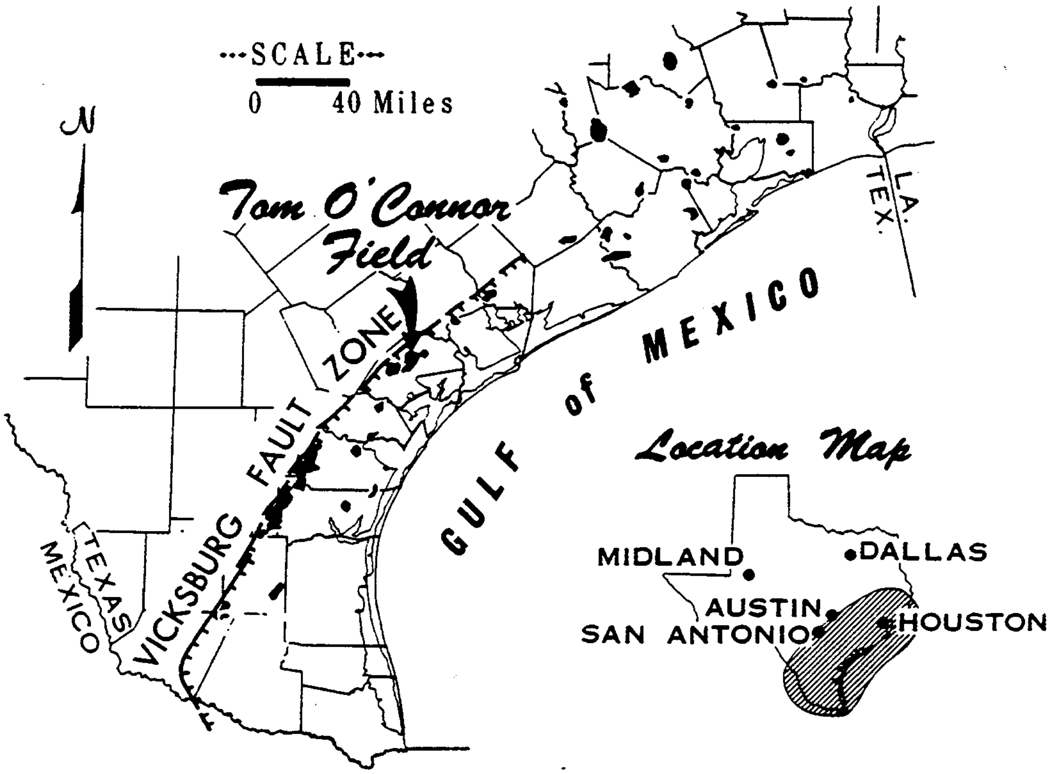



**Figure 3.11: Location of the Tom O'Connor field and other fields along the Vicksburg fault. From Mills[19].**

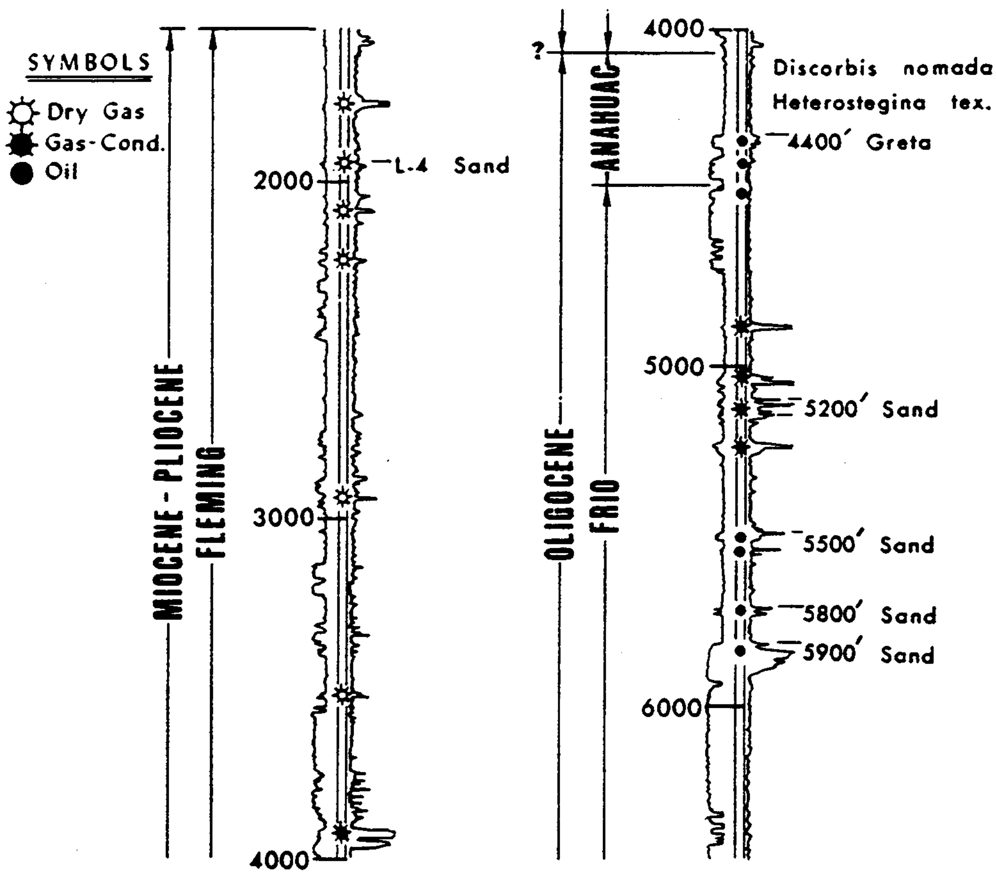



**Figure 3.12: Type log for the Tom O'Connor field showing multiple Frio, Anahuac and Fleming production horizons. From Mills[19].**

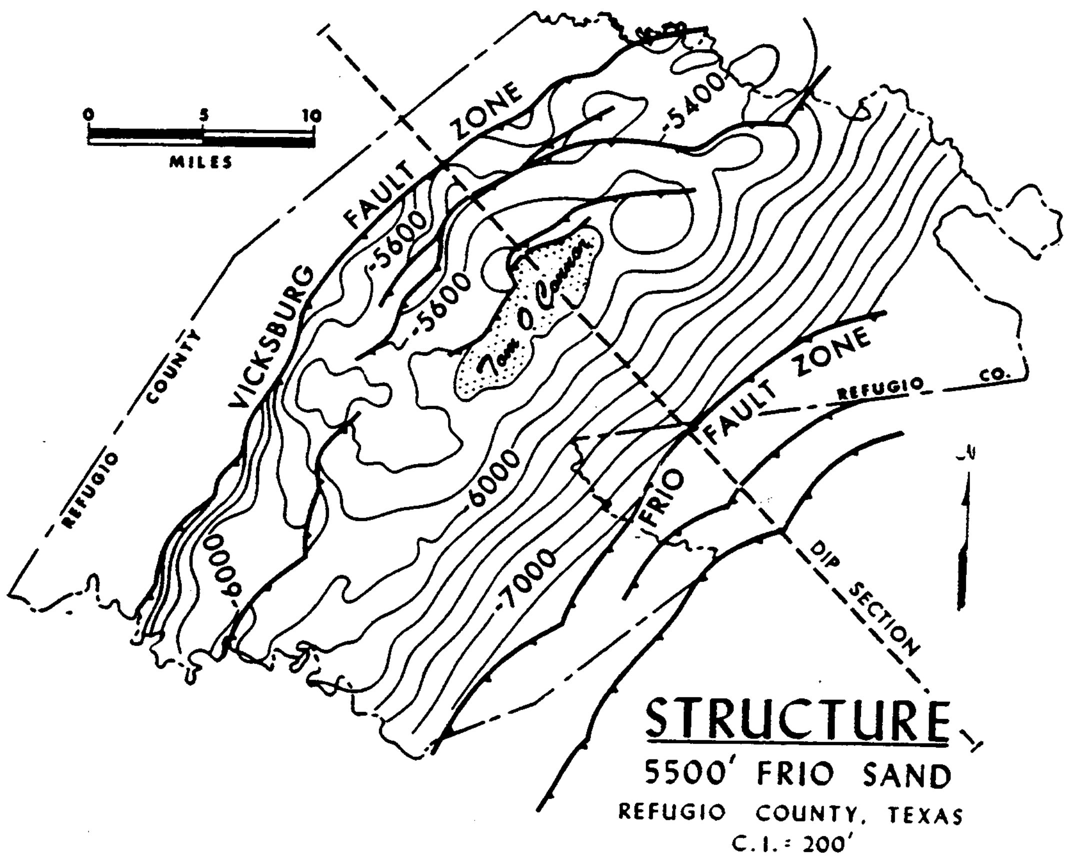



**Figure 3.13: Structure contour map on the top of the 5500' Frio Sand of the Tom O'Connor field showing rollover anticline location relative to faults. From Mills[19].**

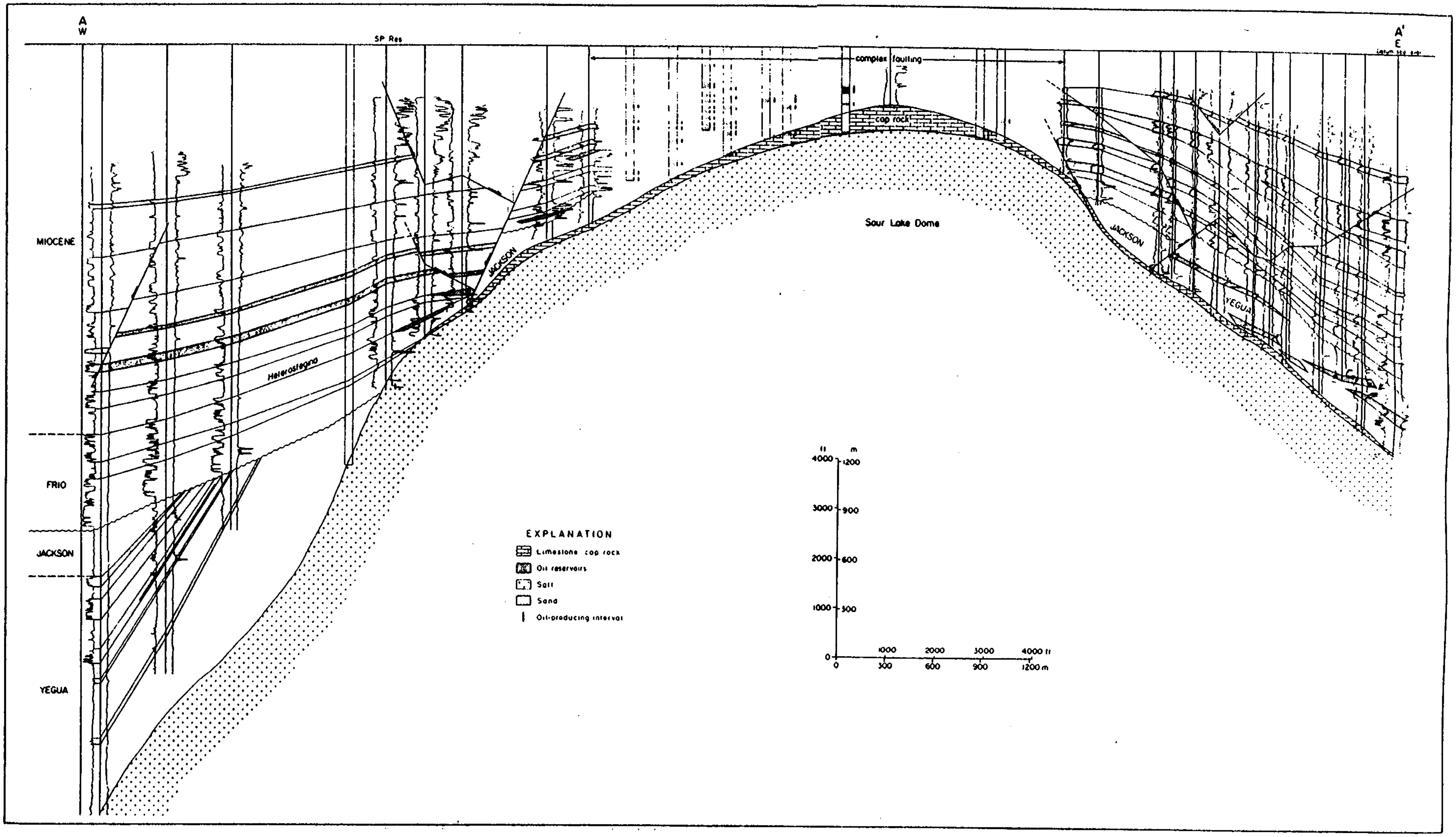



**Figure 3.14: East-west cross section through the Sour Lake field, a shallow piercement dome, in Hardin County, Texas. Note complex faulting in the supra dome area, minor production from the cap rock, and complexities of major reservoirs on the flanks. From Galloway[16].**

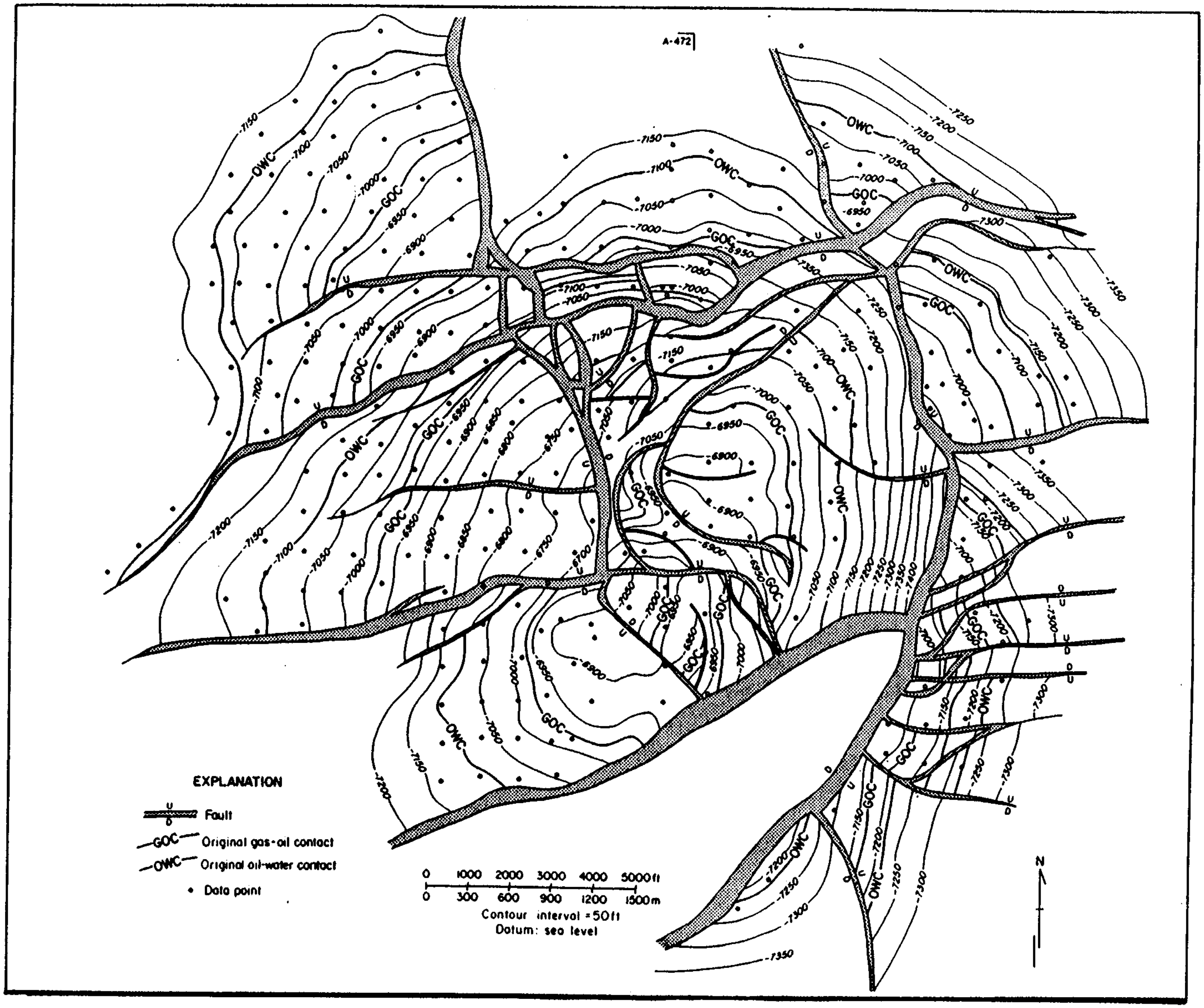
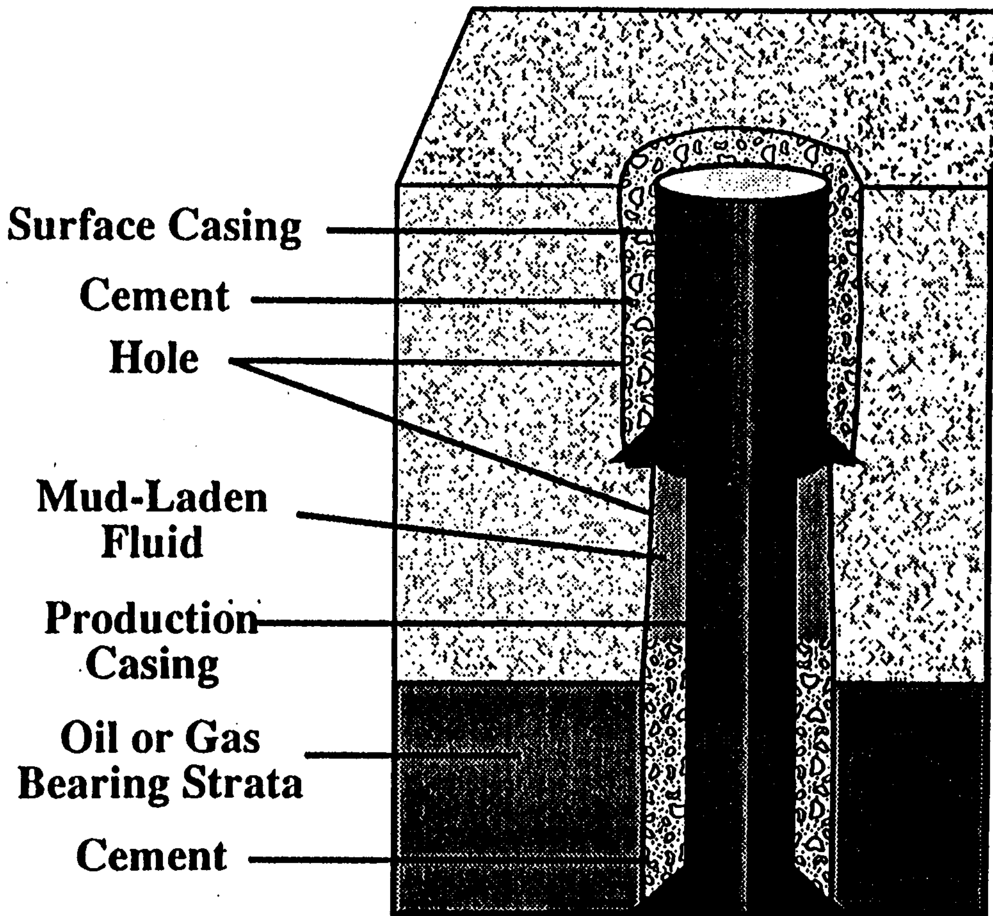


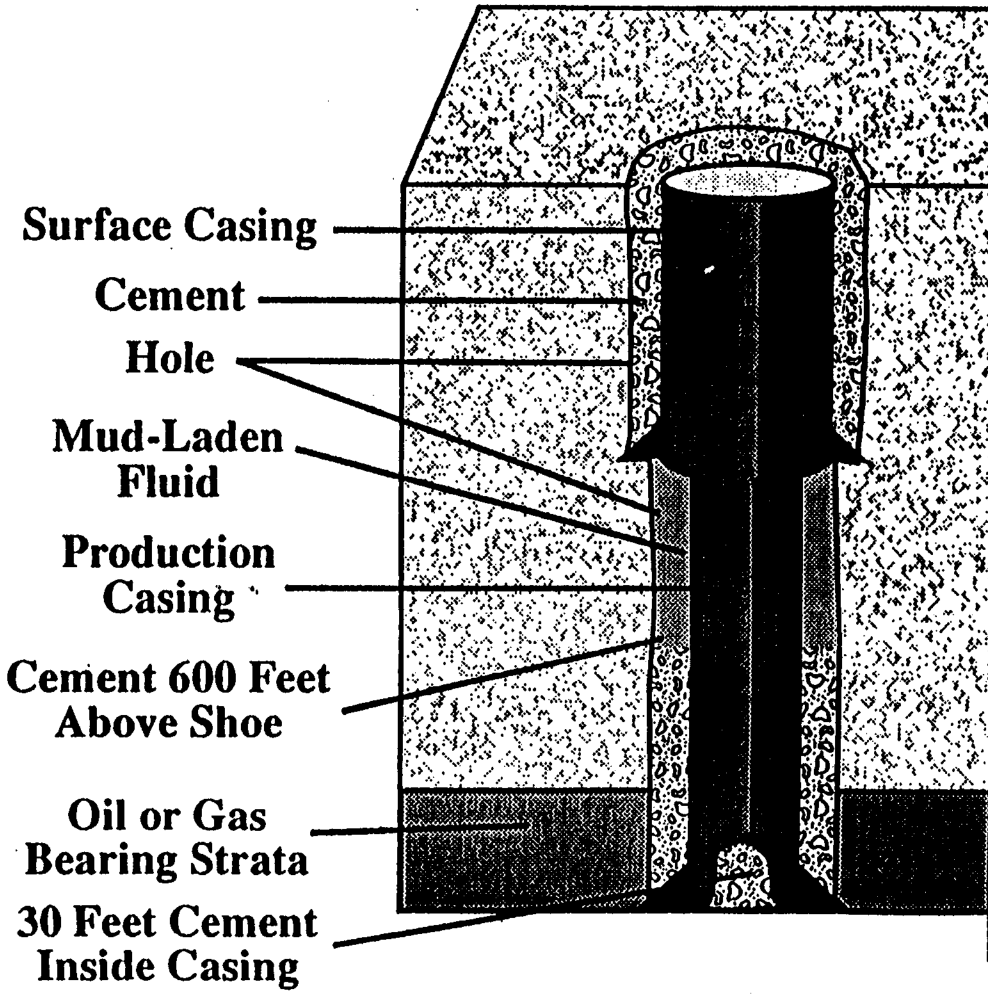

Figure 3.15: Structure contour map on the top of the Frio 4 sand, Anahuac field, Chambers County, Texas showing complex faulting typical of supra domal areas on a deep seated salt dome. From Galloway[16].




Article 6004. Casing.-- The owner or operator of any well being drilled for oil or gas shall, before drilling into the oil or gas-bearing rock, incase such well with good and sufficient wrought iron or steel casing, in such manner as shall exclude all surface or fresh water for the lower part of such well from penetrating the oil or gas-bearing rock. Should any well be first drilled through or into a lower oil or gas-bearing rock, the same shall be cased in such manner as will exclude all fresh water above the last oil or gas-bearing rock penetrated.

Rule 6. Casing in all wells in the Panhandle field must be set and cemented not more than twenty-five (25) feet above the point where the first show of gas is encounterd in the lime formation, when said wells are to be produced from said formation. When wells are to be completed as oil wells at a depth below the lime gas, one string of casing must be set and cemented with sufficient cement to completely and effectually seal off the lime gas formation from other formations, and all casing must be cemented by the pump and plug method. (Adopted October 13, 1931. Effective October 16, 1931.)

**Figure 3.16: 1932 Casing and Cementing Rules and Regulations[22]**




Rule 12 Order No. 20-5513, Effective October 20, 1943.--In any well drilled in any field or area the production string of casing shall be cemented by the pump and plug method, or another method approved by the Commission, with sufficient cement to fill the calculated annular space back of the casing to a point at least six hundred (600) feet above the shoe. Where three thousand (3000) feet or more of pipe is set for the producing or protecting string, a minimum of thirty (30) feet of cement shall be left inside the pipe. Before drilling the cement plug in the producing string of casing of any well, the casing shall be tested at a pressure in pounds per square inch calculated by multiplying the length of the producing string by two-tenths (.2) with the maximum test pressure required, unless otherwise ordered by the Commission, not to exceed fifteen hundred (1500) pounds per square inch. If at the end of thirty (30) minutes pressure shows a drop of ten (10%) percent, or more, of the above required test pressure, the casing shall be condemned. After corrective operation the casing shall again be tested in the same manner. Bailing test may be used by reducing the fluid level in the hole to a point at least midway between the calculated top and bottom of the cement columns on the outside of the string being tested.

**Figure 3.17: 1934 & 1943 Casing and Cementing Rules and Regulations**[22]

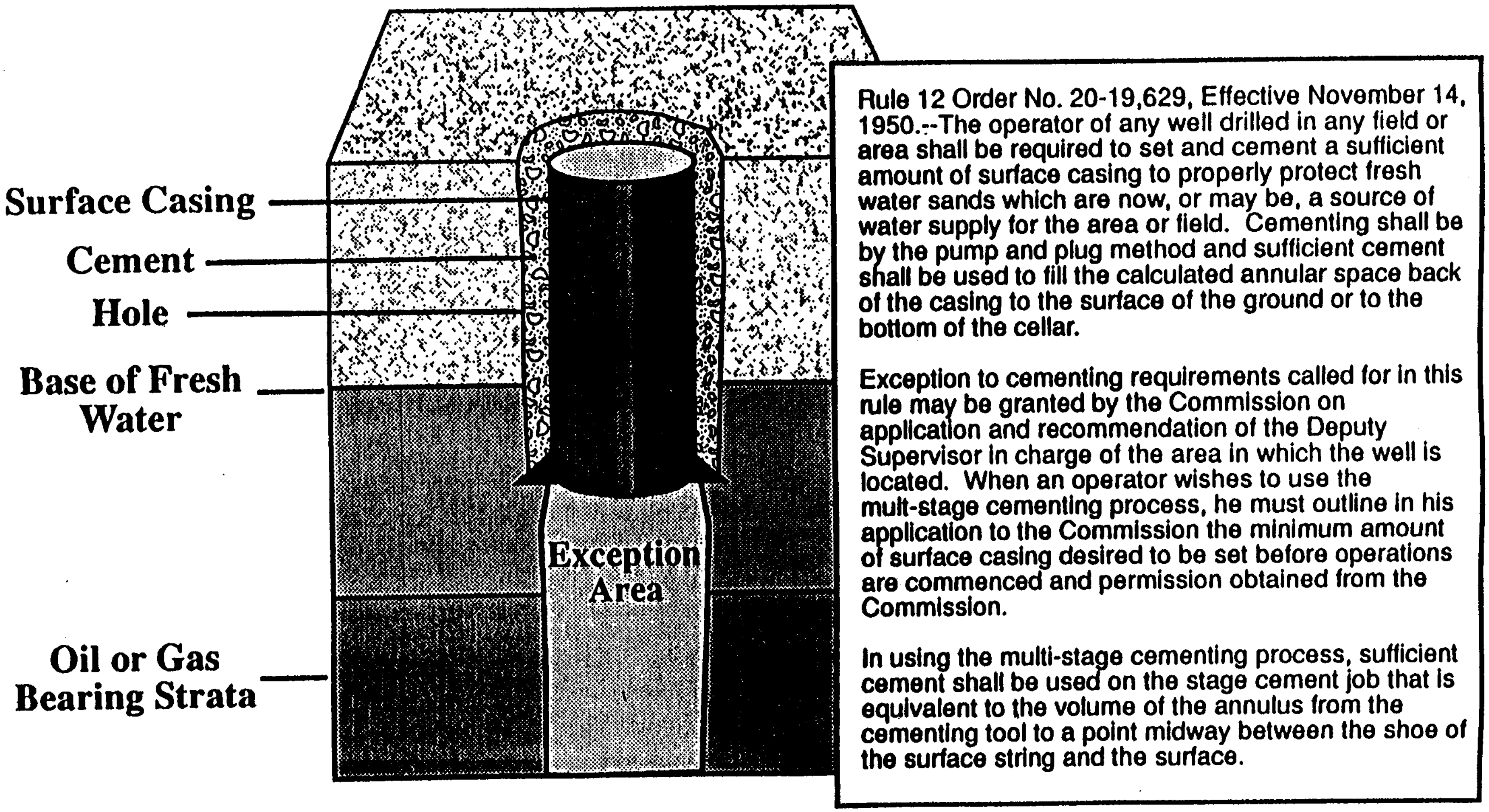
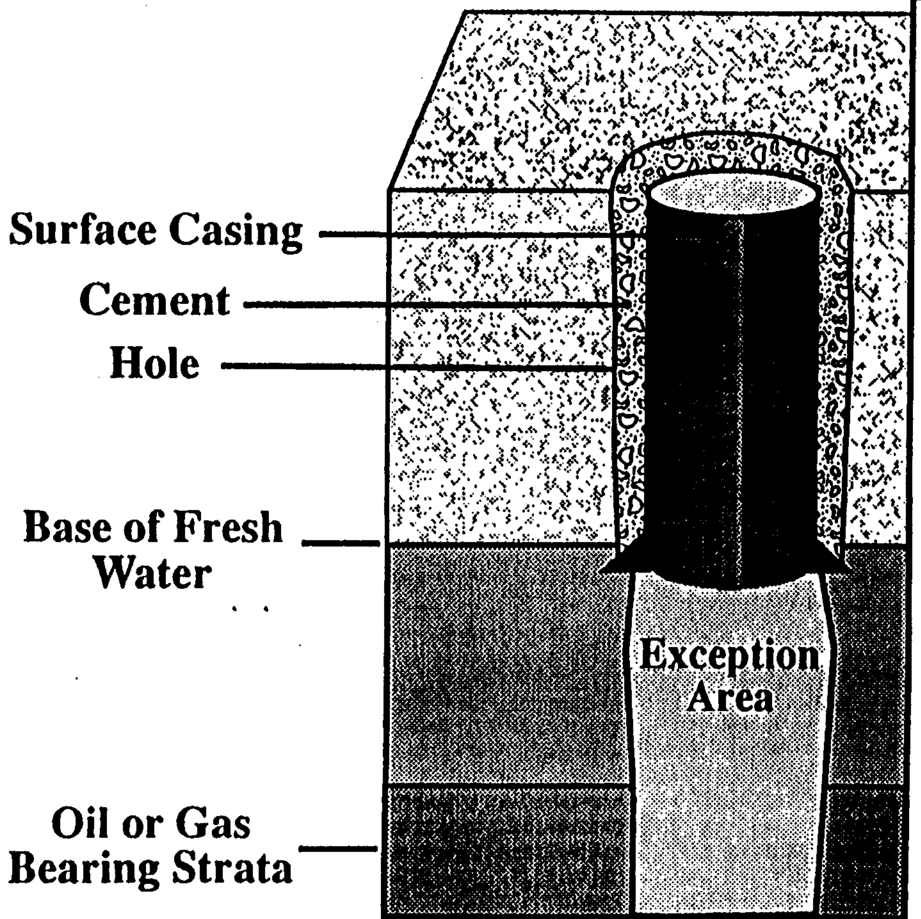



Figure 3.18: 1950 Casing and Cementing Rules and Regulations[22]




Rule 13. The operator of any well drilled in any field or area shall be required to set and cement a sufficient amount of surface casing to properly protect fresh water sands which are now, or may be, a source of water supply for the area or field. Cementing shall be by the pump and plug method and sufficient cement shall be used to fill the calculated annular space back of the casing to the surface of the ground or to the bottom of the cellar.

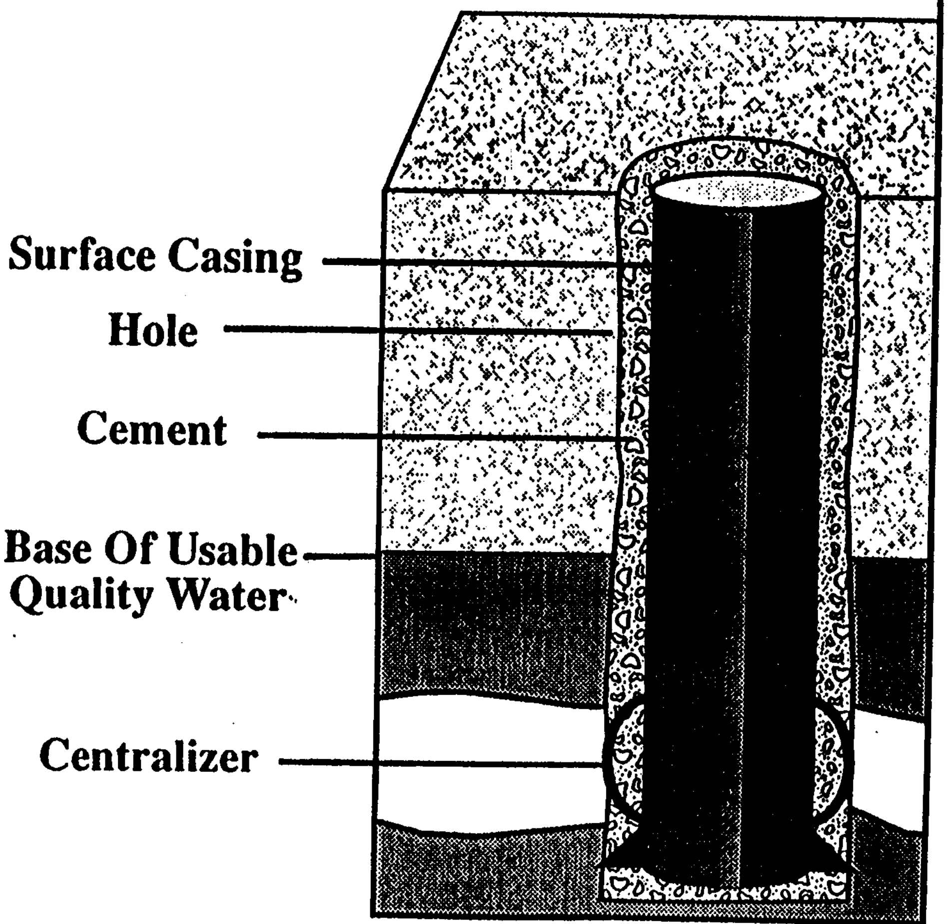
A. Exception to cementing requirements called for in this rule may be granted by the Commission on application. An operator shall, before drilling and setting casing in his first well in a field or area, obtain from the Texas Water Development Board a letter stating where the fresh water sands are found in the area or field in question. Such operator must set the surface casing to the depth recommended by the Texas Water Development Board to protect all fresh water sands.

B. When an operator wishes to use the multistage process, he must outline in his application to the Commission the minimum amount of surface casing desired to be set before operations are commenced, and permission must be obtained from the Commission. After the operation is completed, he must then file with the Commission an affidavit (Form X-105) made by the cementing company's representative showing where the stage cement tool was set and the number of sacks of cement used in the operation.

C. In using the multi-stage cementing process, sufficient cement shall be used on the stage cement job that is equivalent to the volume of the annulus from the cementing tool to a point midway between the shoe of the surface string and the surface.

This authority will not be granted in fields where the special rules require the setting of a specific amount of casing for reasons other than the protection of fresh water sands; an exception to this provision may be granted after due notice and hearing, wherein the multistage process is shown to be feasible.

Figure 3.19: 1963 Casing and Cementing Rules and Regulations[22]




Rule 13. Surface Casing.--Set and cement sufficient surface casing to protect all usable-quality water strata, as defined by the Texas Department of Water Resources. Where no field rules are in effect, an operator shall obtain a letter from the Texas Department of Water Resources stating the protection depth. Surface casing shall not be set deeper than 200 feet below the specified depth without prior approval from the Commission.

Any well drilled to at total depth of 1000 feet or less below the ground surface may be drilled without setting surface casing provided no shallow gas sands or abnormally high pressures exist, and provided that production casing is cemented from the shoe to the ground surface by the pump and plug method.

Cementing shall be by the pump and plug method, sufficient cement shall be used to fill the annular space outside the casing from the shoe to the ground surface or to the bottom of the cellar. If cement does not circulate to ground surface the operator shall obtain the approval of the district director for the procedures to be used.

Cement Quality.--Surface casing must be allowed to stand under pressure until the cement has reached a compressive strength of at least 500 psi in the zone of critical cement before drilling plug or initiating a test. The cement mixture in the zone of critical cement shall have a 72 hour compressive strength of at least 1200 psi.

If volume extenders are used above the critical cement to cement the casing, the cement must have a compressive strength of no less than 100 psi at the time of drill out nor less than 250 psi 24 hours after being placed.

API free water sepation shall average no more than six milliliter per 250 milliliters of cement tested in accordance with the current API RP 10B.

Surface casing shall be centralized at the shoe, above and below a stage collar or diverting tool, if run, and through usable-quality water zones. A centralizer shall be placed every fourth joint from the cement shoe to the ground surface or to the bottom of the cellar.

Figure 3.20: 1983 Casing and Cementing Rules and Regulations[22]

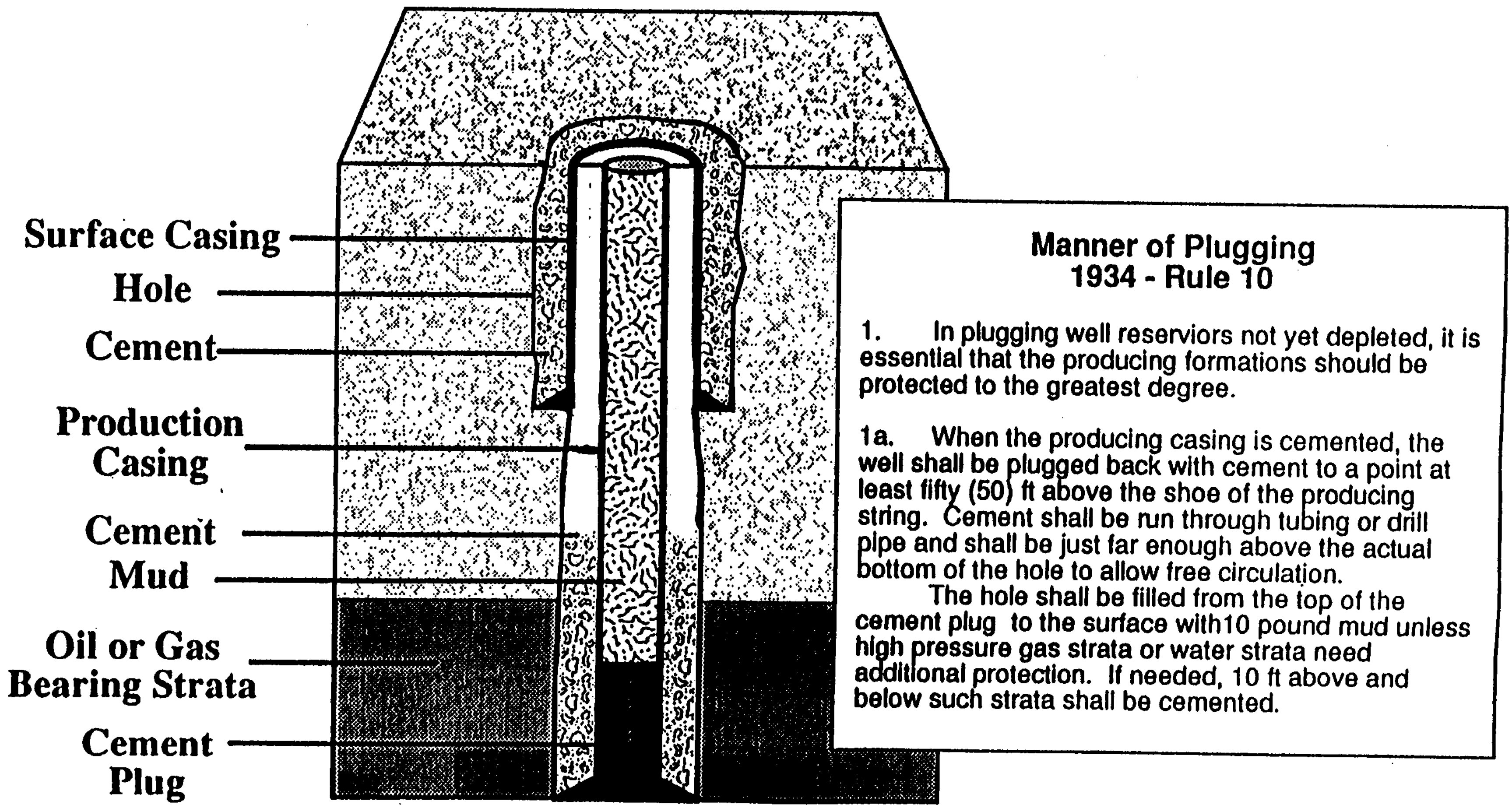



**Figure 3.21: 1934 Well Abandonment Regulations - Well Plugging Rule 10**[22]

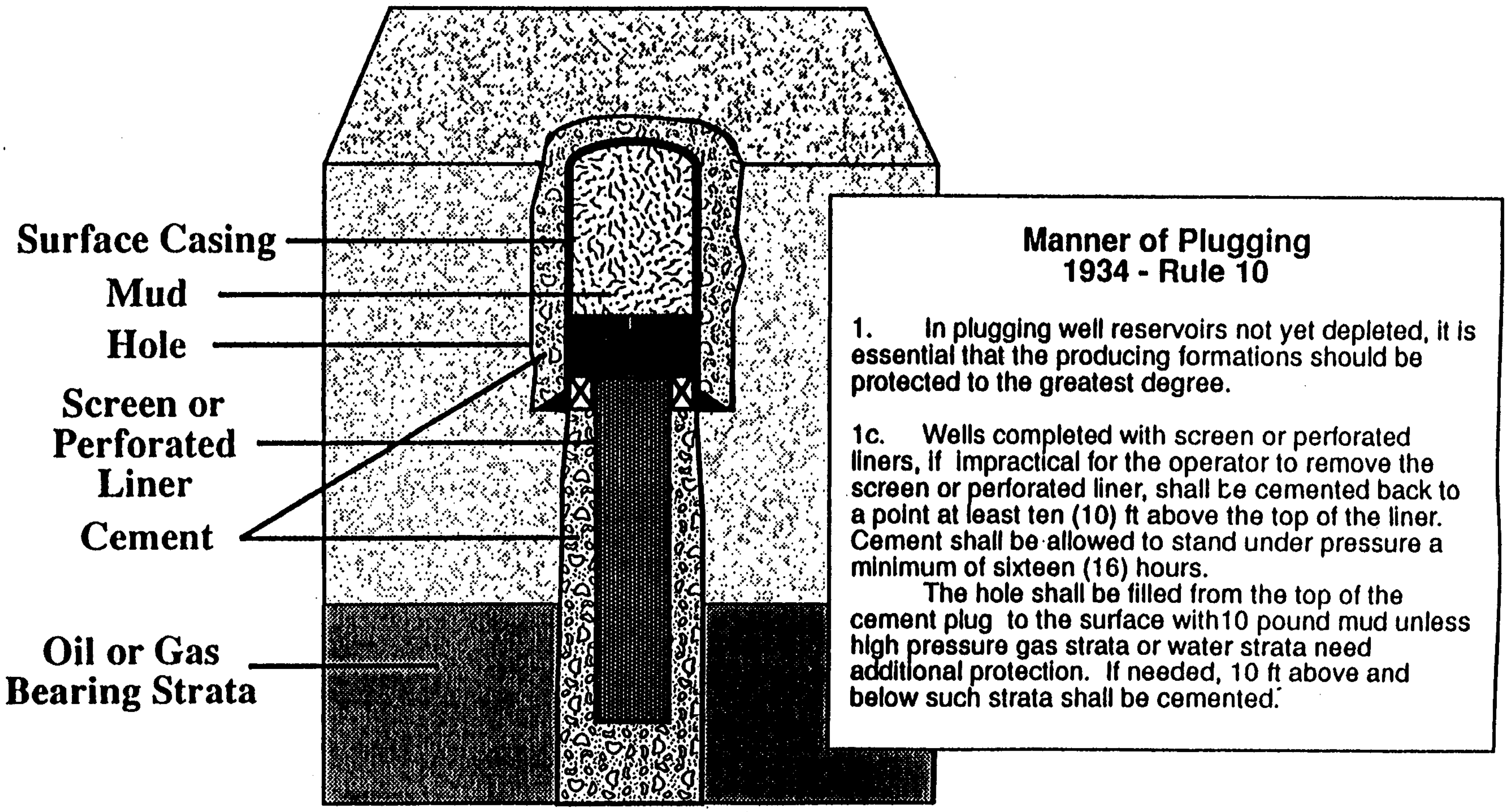



**Figure 3.22: 1934 Well Abandonment Regulations - Well Plugging Rule 10**[22]

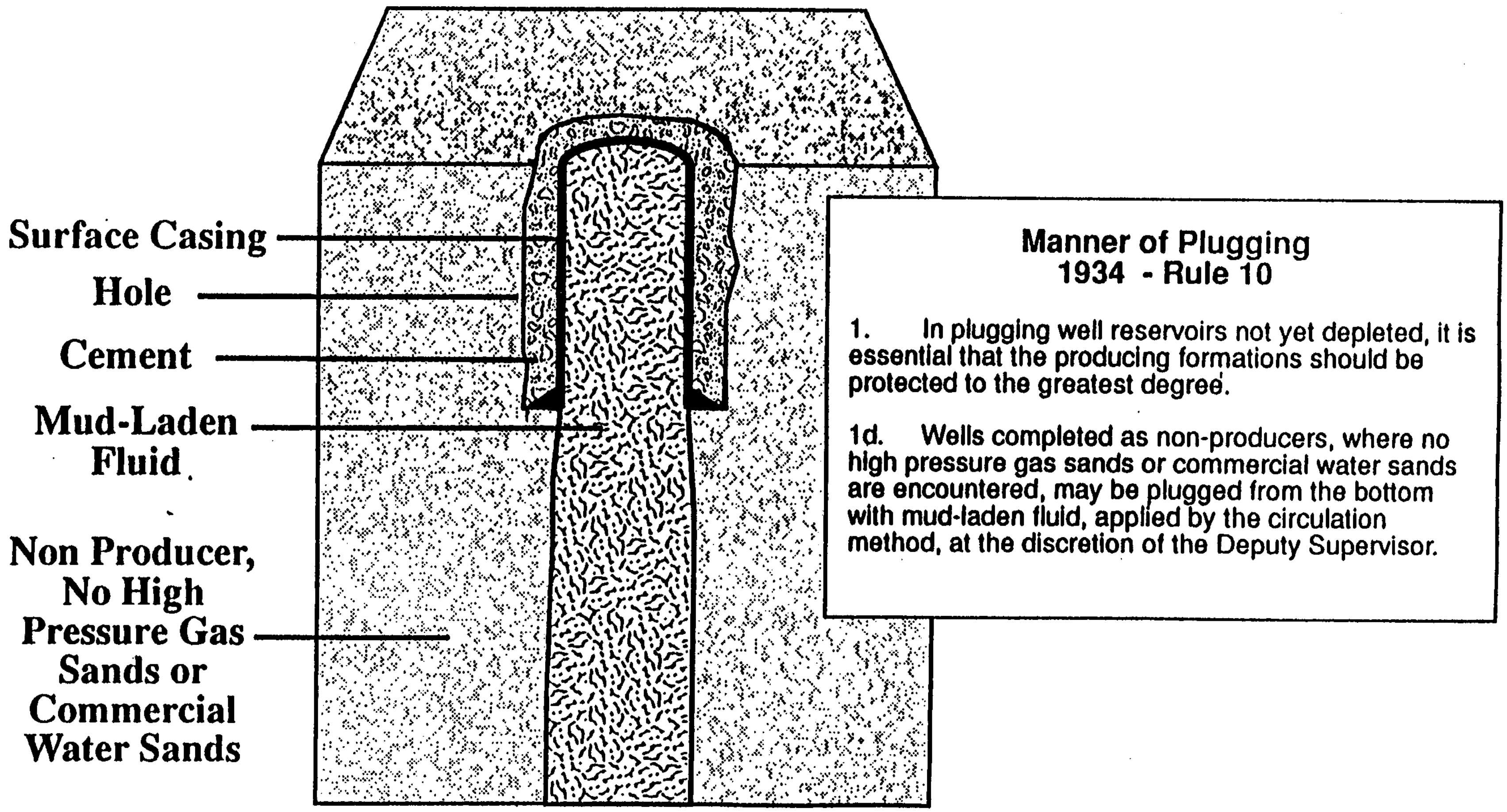



**Figure 3.23: 1934 Well Abandonment Regulations - Well Plugging Rule 10**[22]

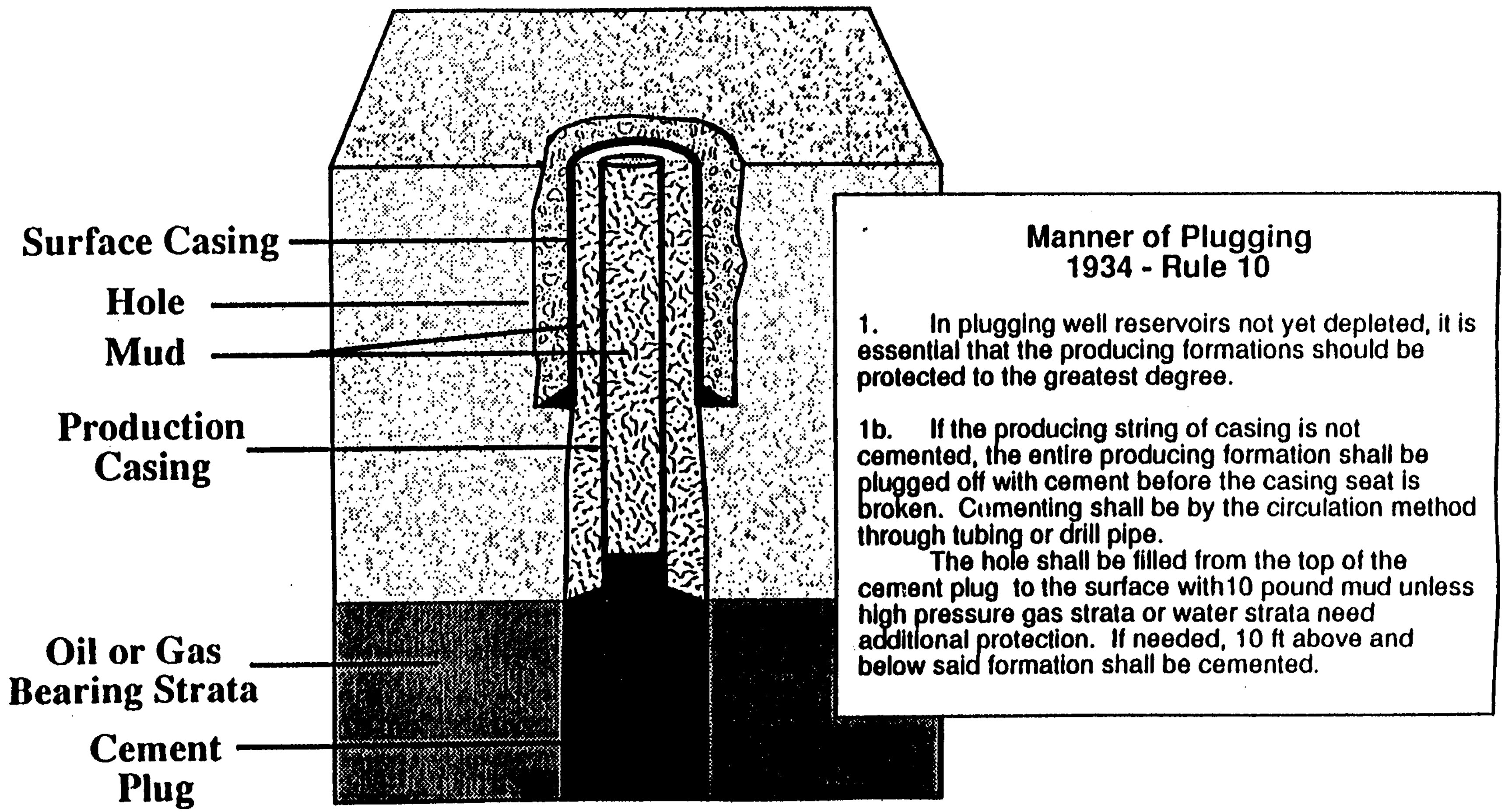



Figure 3.24: 1934 Well Abandonment Regulations - Well Plugging Rule 10[22]

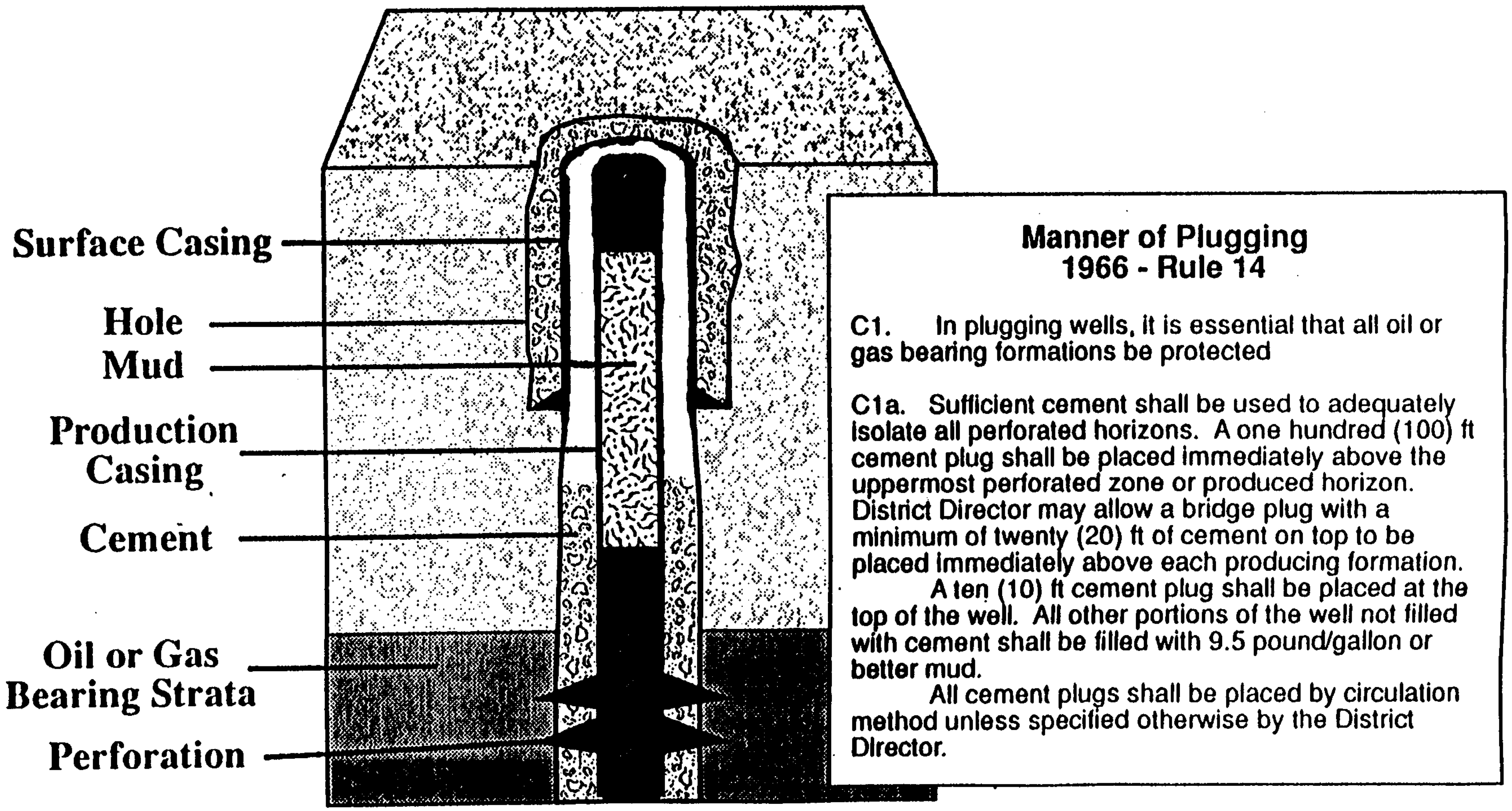



Figure 3.25: 1966 Well Abandonment Regulations - Well Plugging Rule 14[22]

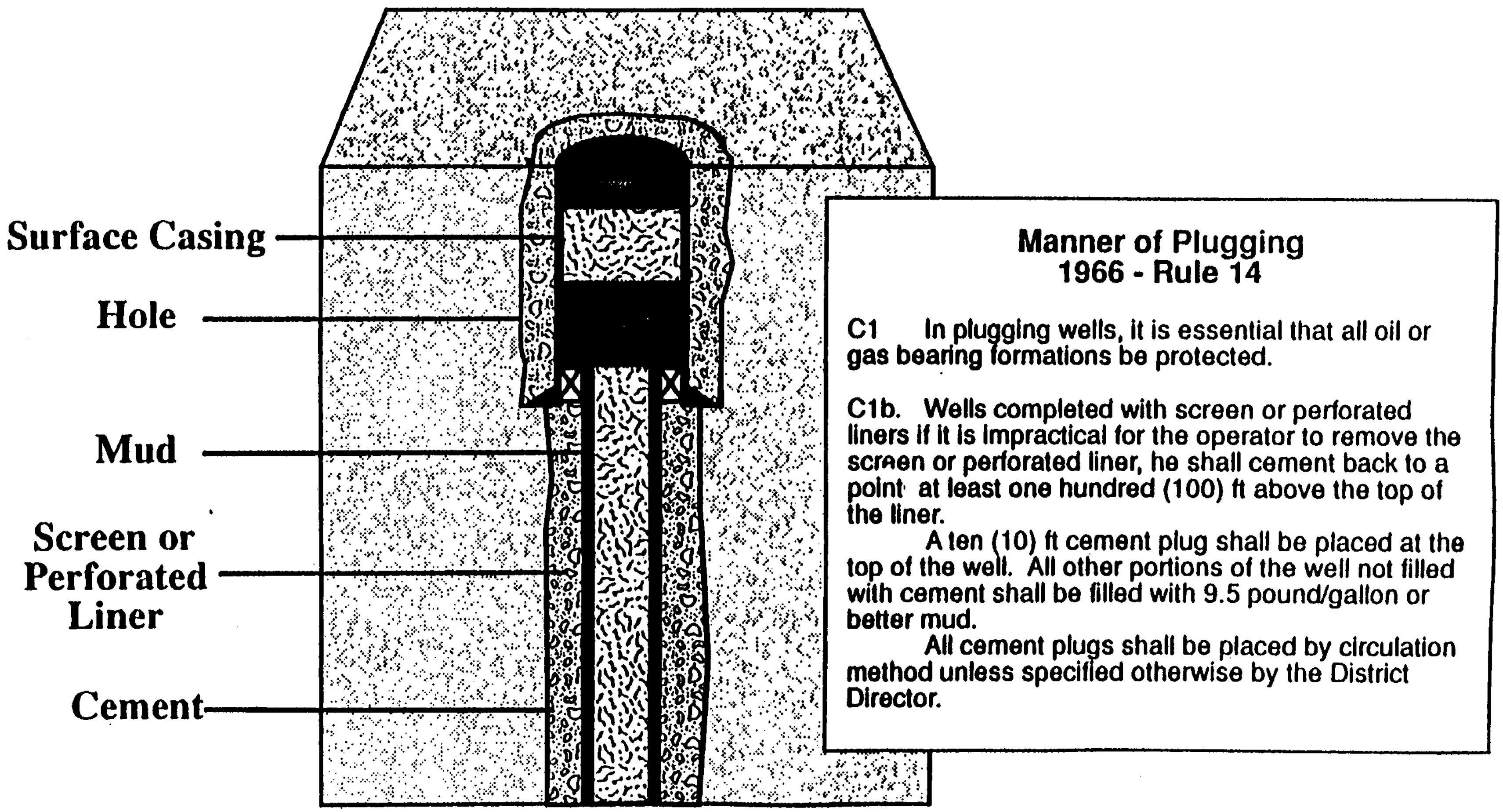



**Figure 3.26: 1966 Well Abandonment Regulations - Well Plugging Rule 14[22]**

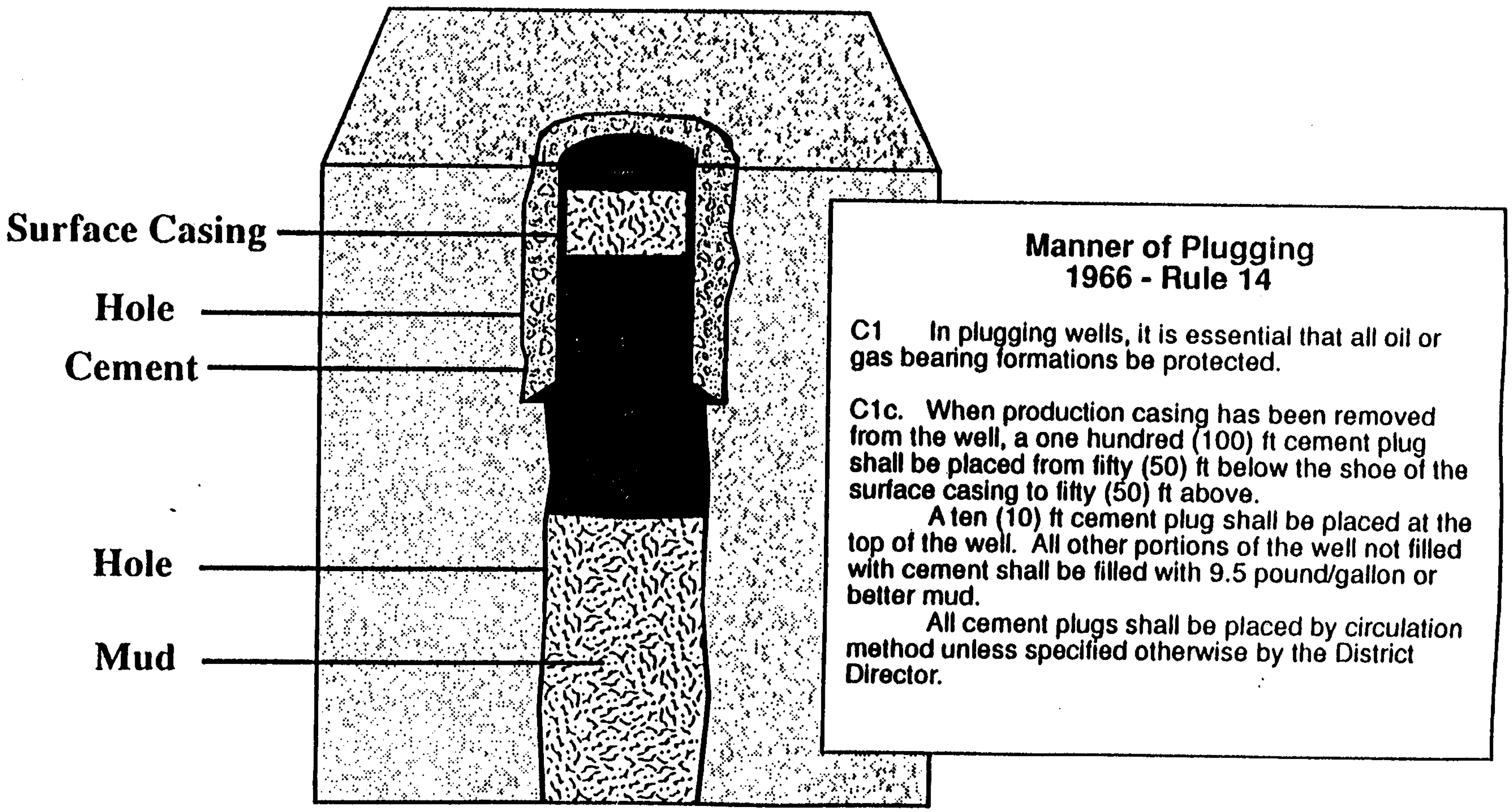



Figure 3.27: 1966 Well Abandonment Regulations - Well Plugging Rule 14[22]

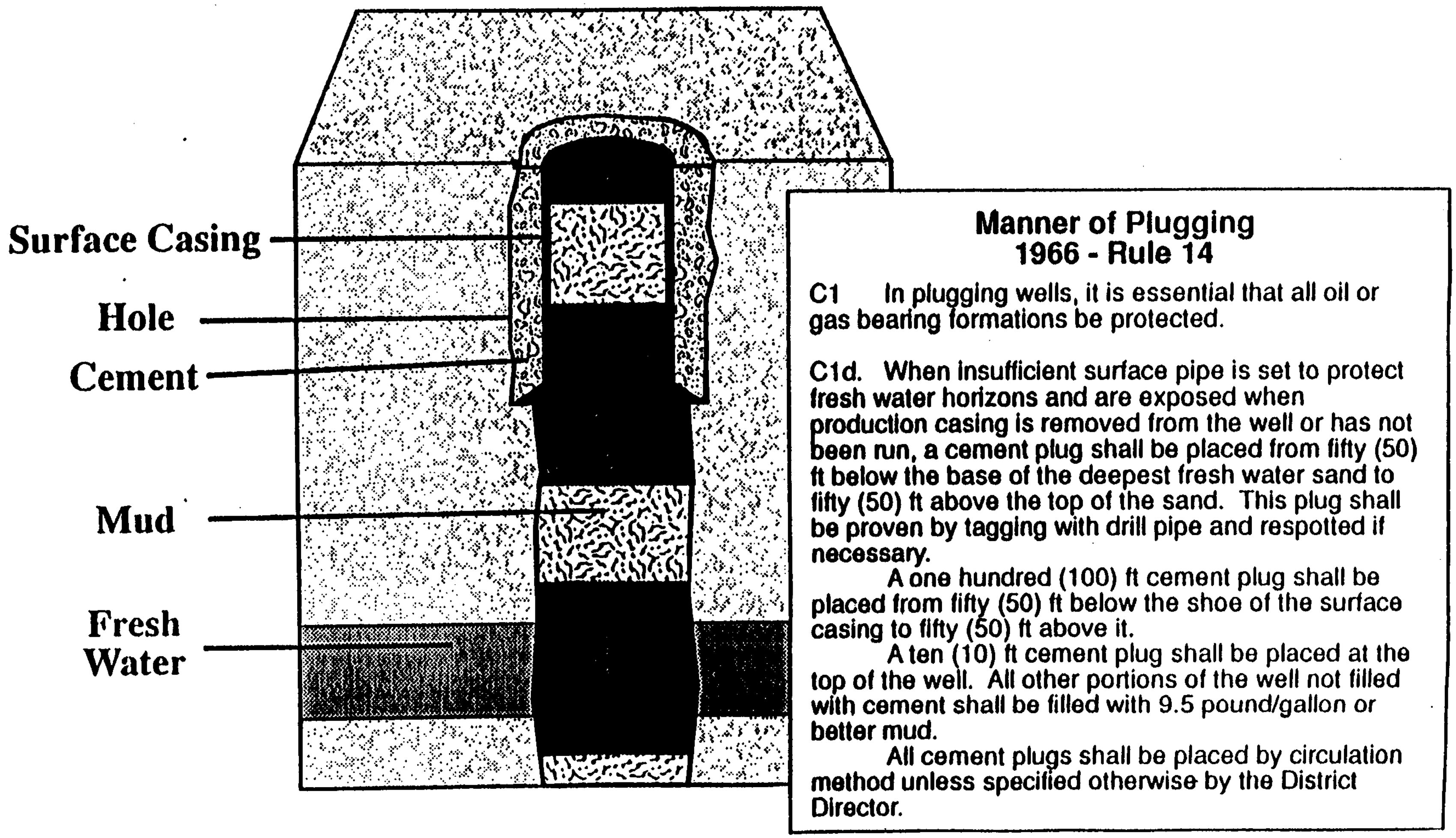



**Figure 3.28: 1966 Well Abandonment Regulations - Well Plugging Rule 14[22]**

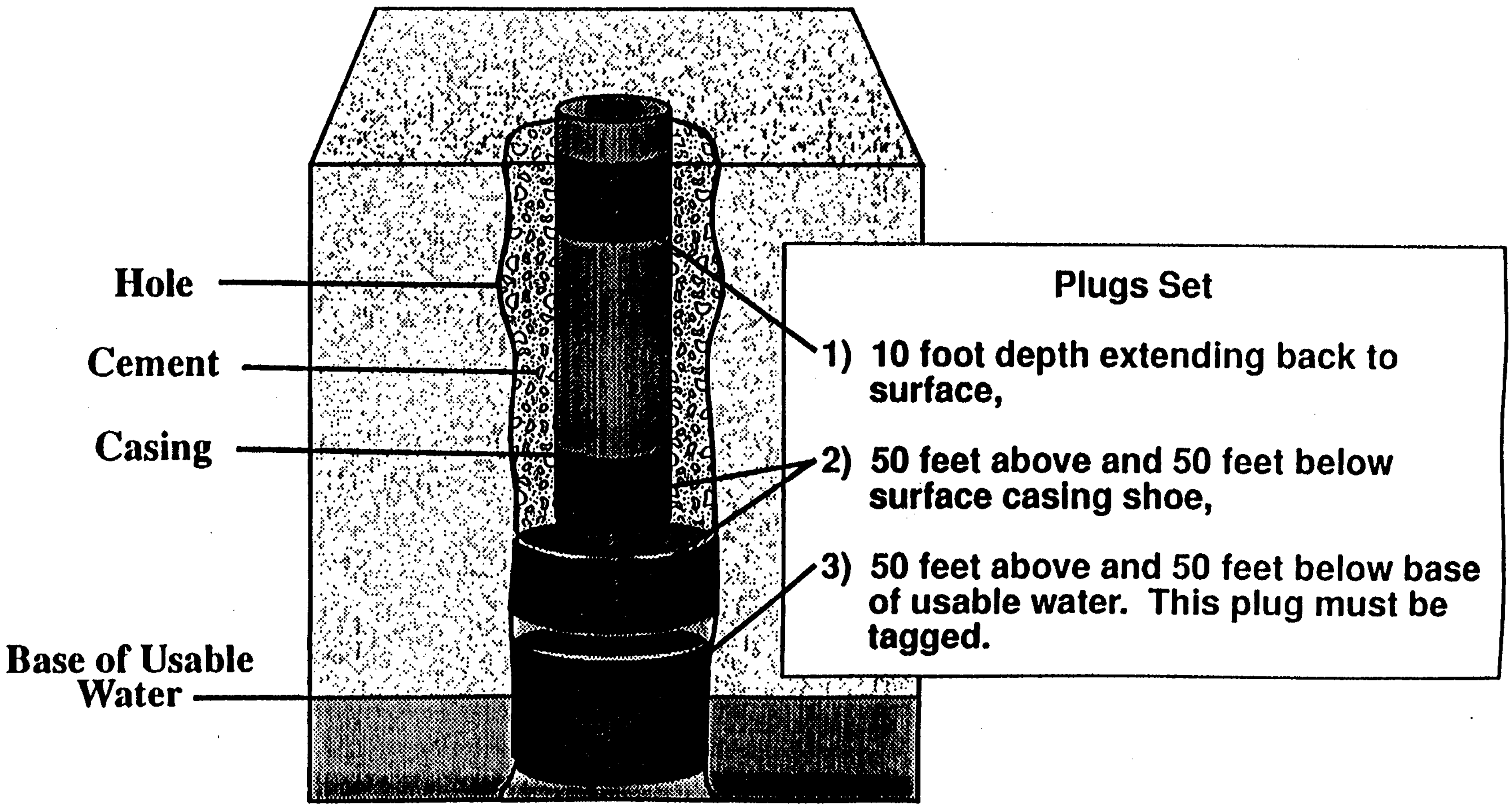



Figure 3.29: 1983 Well Abandonment Regulations[22]

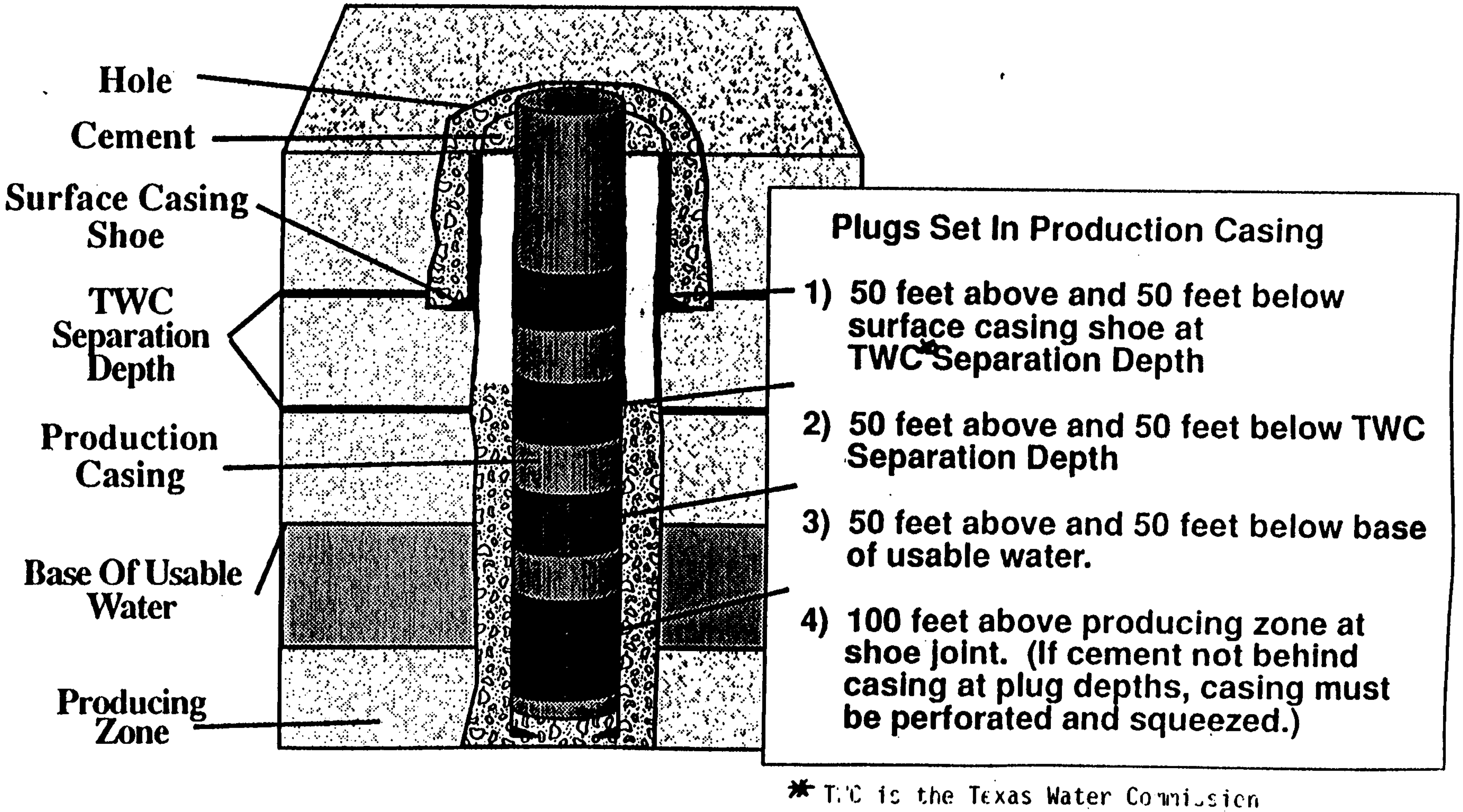



Figure 3.30: 1983 Well Abandonment Regulations[22]

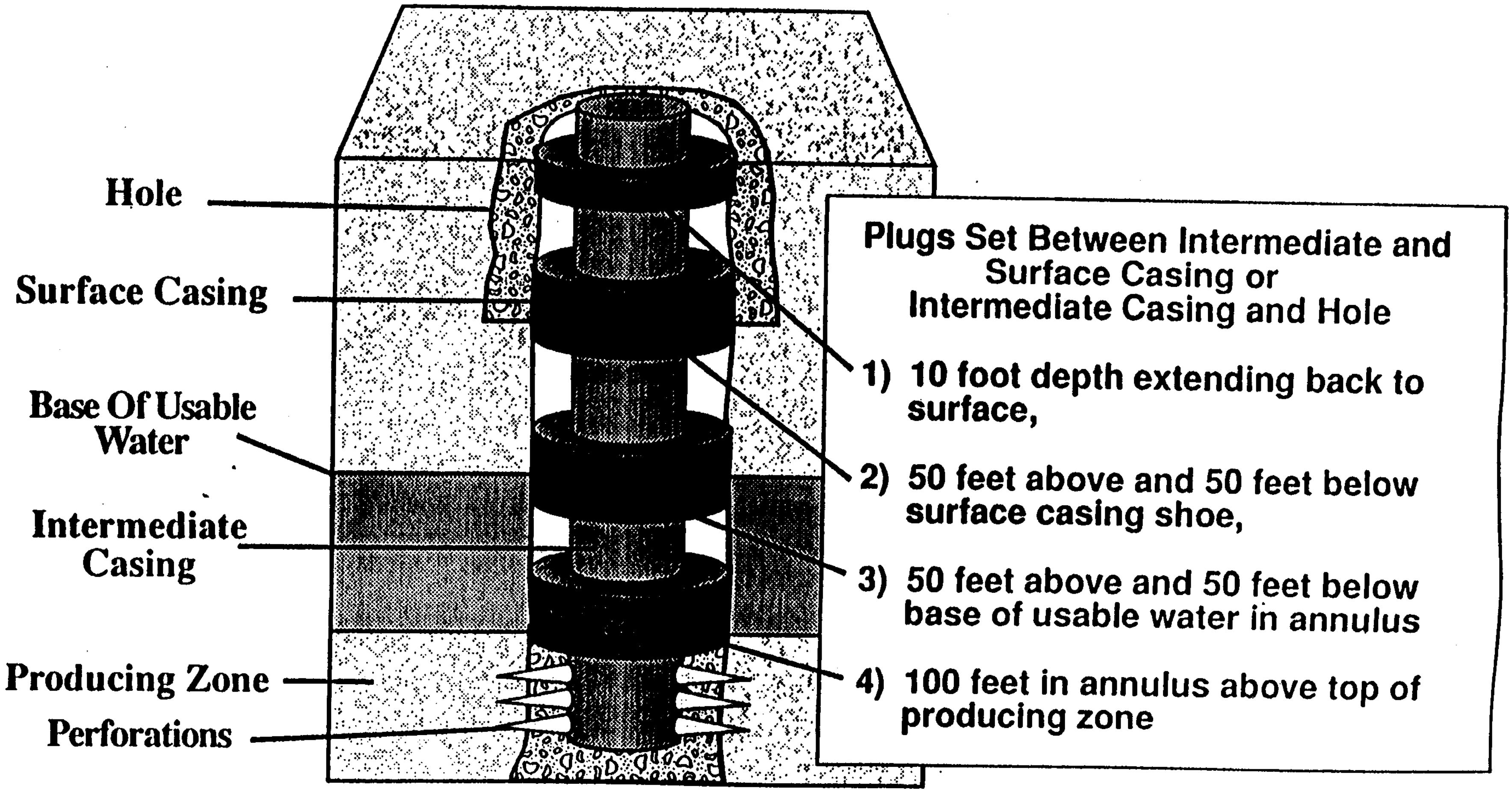



Figure 3.31: 1983 Well Abandonment Regulations[22]

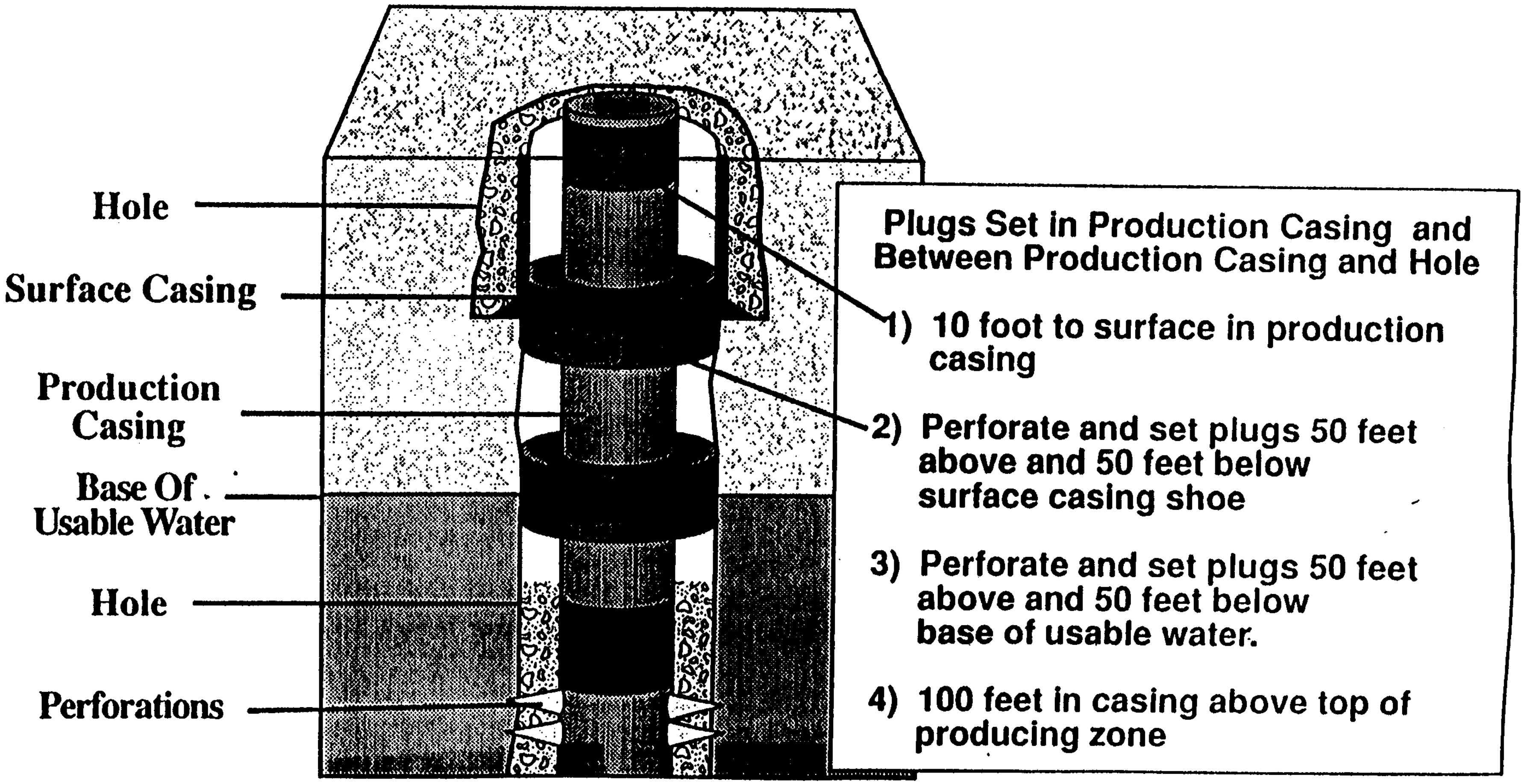



Figure 3.32: 1983 Well Abandonment Regualtions[22]

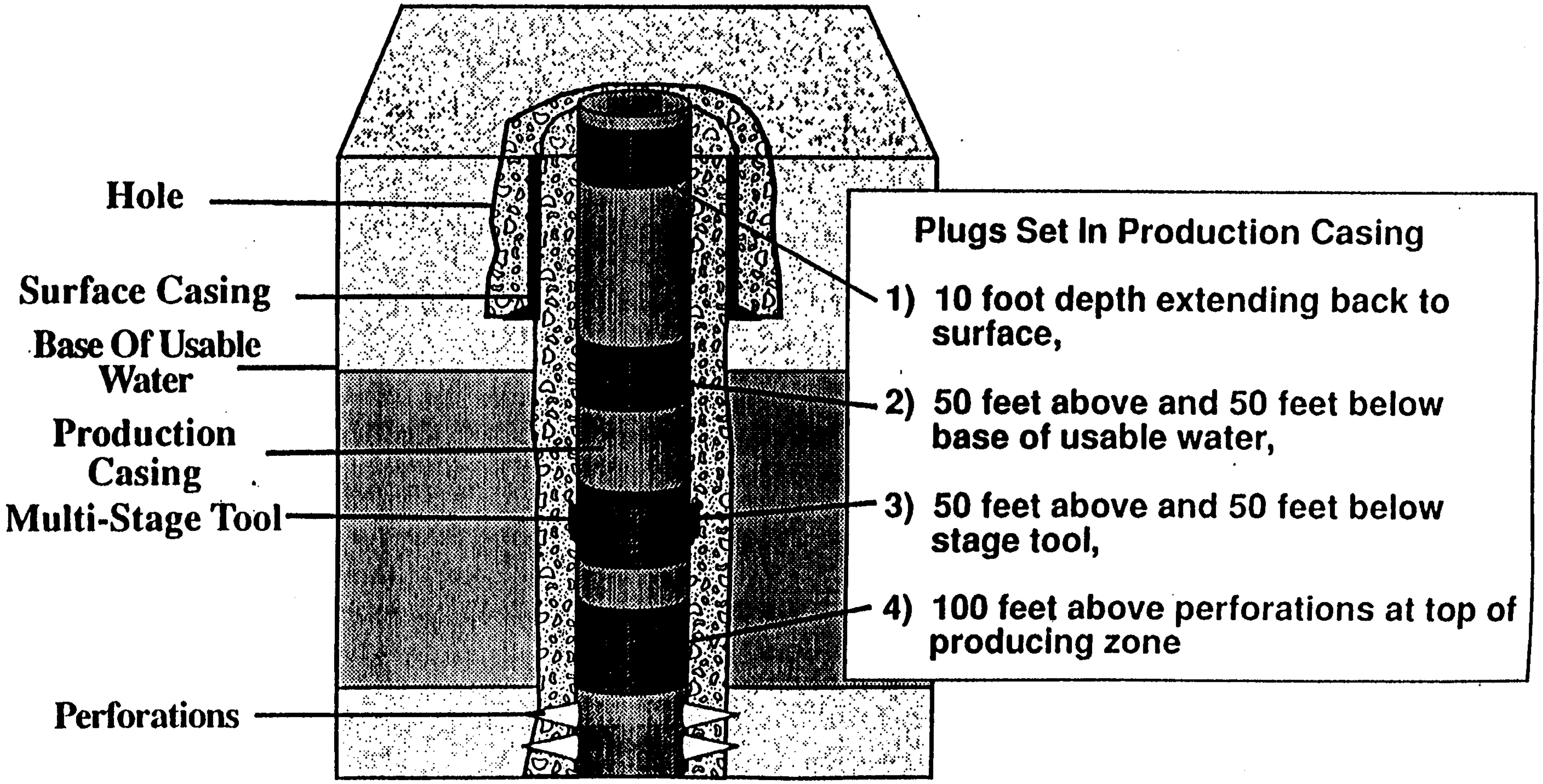



Figure 3.33: 1983 Well Abandonment Regulations[22]

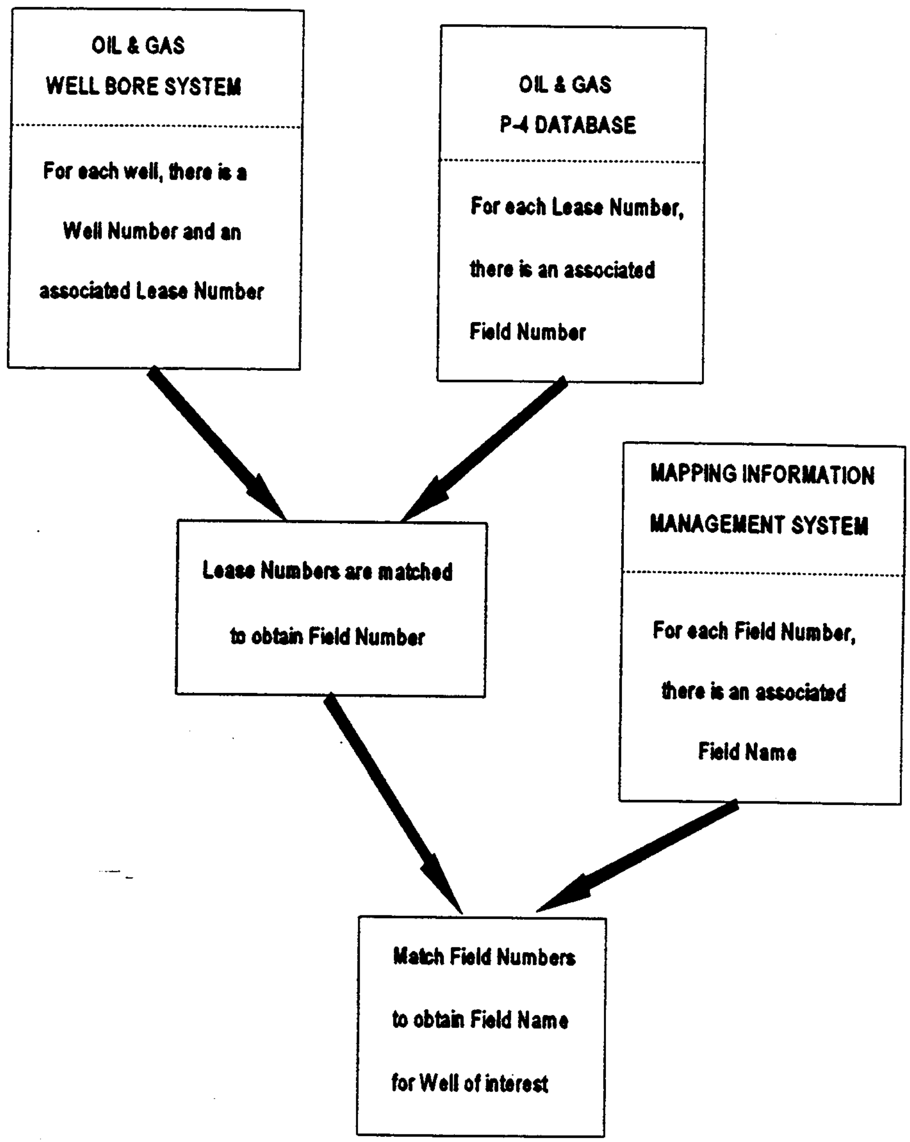
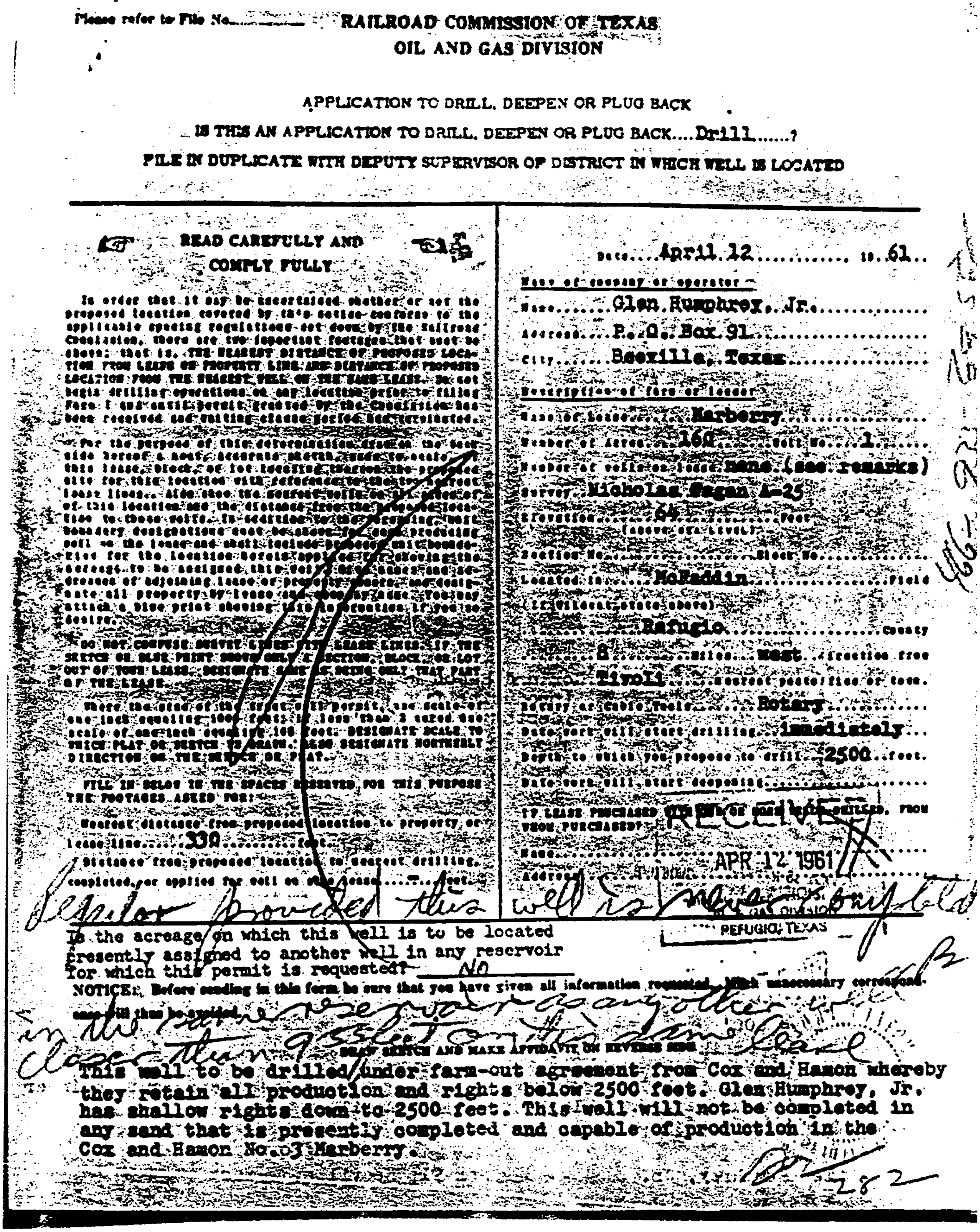



Figure 3.34
Field Matching Technique for TRRC Databases

```
               UMR Well Review Project              Date :  6/ 7/1995
            SCOUT Program - Version:95.157
          Data from Petroleum Information
County =  39                              API # =  39-   765
DRY HOLE
Formation @ TD: 653VKBG                   Prod. Formation:
Well Status: D&A-OG                       Total Depth =   7509
Spud Date =  3/28/63                      Completion Date =  5/27/63
Latitude = 29.49098                       Longitude =  95.23517
ABANDONED WELL
N-S Loc.:  2210 FS                        E-W Loc.:  3350 FW
Footage Ref.:    SURVEY LN                Township:
Block:    000                             Section: SEC002
Survey Name: W T HUGHES
Operator: PAN AM                          Lease: GILBERT SNEED
Field: HASTINGS E
Casing Data:
    Size: 10 3/4      Depth:  2017      Sacks Cmt.:     0
    Size: 5 1/2       Depth:  7312      Sacks Cmt.:     0
```

**Figure 3.35: Example of UMR Scout Program printout for data from PI abandoned well database.**



Please refer to File No.......... RAILROAD COMMISSION OF TEXAS

OIL AND GAS DIVISION

APPLICATION TO DRILL, DEEPEN OR PLUG BACK

IS THIS AN APPLICATION TO DRILL, DEEPEN OR PLUG BACK....Drill......?

FILE IN DUPLICATE WITH DEPUTY SUPERVISOR OF DISTRICT IN WHICH WELL IS LOCATED

READ CAREFULLY AND COMPLY FULLY

In order that it may be ascertained whether or not the proposed location covered by this notice conforms to the applicable spacing regulations set down by the Railroad Commission, there are two important footages that must be shown; that is, THE NEAREST DISTANCE OF PROPOSED LOCATION FROM LEASE OR PROPERTY LINE AND DISTANCE OF PROPOSED LOCATION FROM THE NEAREST WELL ON THE SAME LEASE. Do not begin drilling operations on any location prior to filing Form 1 and until permit granted by the Commission has been received and waiting clause period has terminated.

[illegible]

DO NOT CONFUSE SURVEY LINES WITH LEASE LINES. IF THE SKETCH OR BLUE PRINT SHOWS ONLY A SECTION, BLOCK, OR LOT OUT OF YOUR LEASE, DESIGNATE SAME AS BEING ONLY THAT PART OF THE LEASE.

[illegible]

FILL IN BELOW IN THE SPACES RESERVED FOR THIS PURPOSE THE FOOTAGES ASKED FOR:

Nearest distance from proposed location to property or lease line....330....feet.

Distance from proposed location to nearest drilling, completed, or applied for well on same lease......feet.

Date....April 12..........19..61..

Name of company or operator —

Name......Glen Humphrey, Jr.

Address....P. O. Box 91

City......Beeville, Texas

Description of farm or lease:

Name of lease......Marberry

Number of Acres....160.......Well No....1

Number of wells on lease..None (see remarks)

Survey..Nicholas Fagan A-25

Elevation.......64.......feet (above sea level)

Section No.............Block No.

Located in......McFaddin.............Field (if wildcat, state above)

.........Refugio.........County

......8......Miles....West...direction from

......Tivoli......nearest post office or town.

Rotary or Cable Tools.......Rotary

Date work will start drilling.....immediately

Depth to which you propose to drill....2500...feet.

Date work will start deepening.............

IF LEASE PURCHASED WITH ONE OR MORE WELLS DRILLED, FROM WHOM PURCHASED?

Name.........

Address.........

RECEIVED APR 12 1961 ... GAS DIVISION REFUGIO, TEXAS

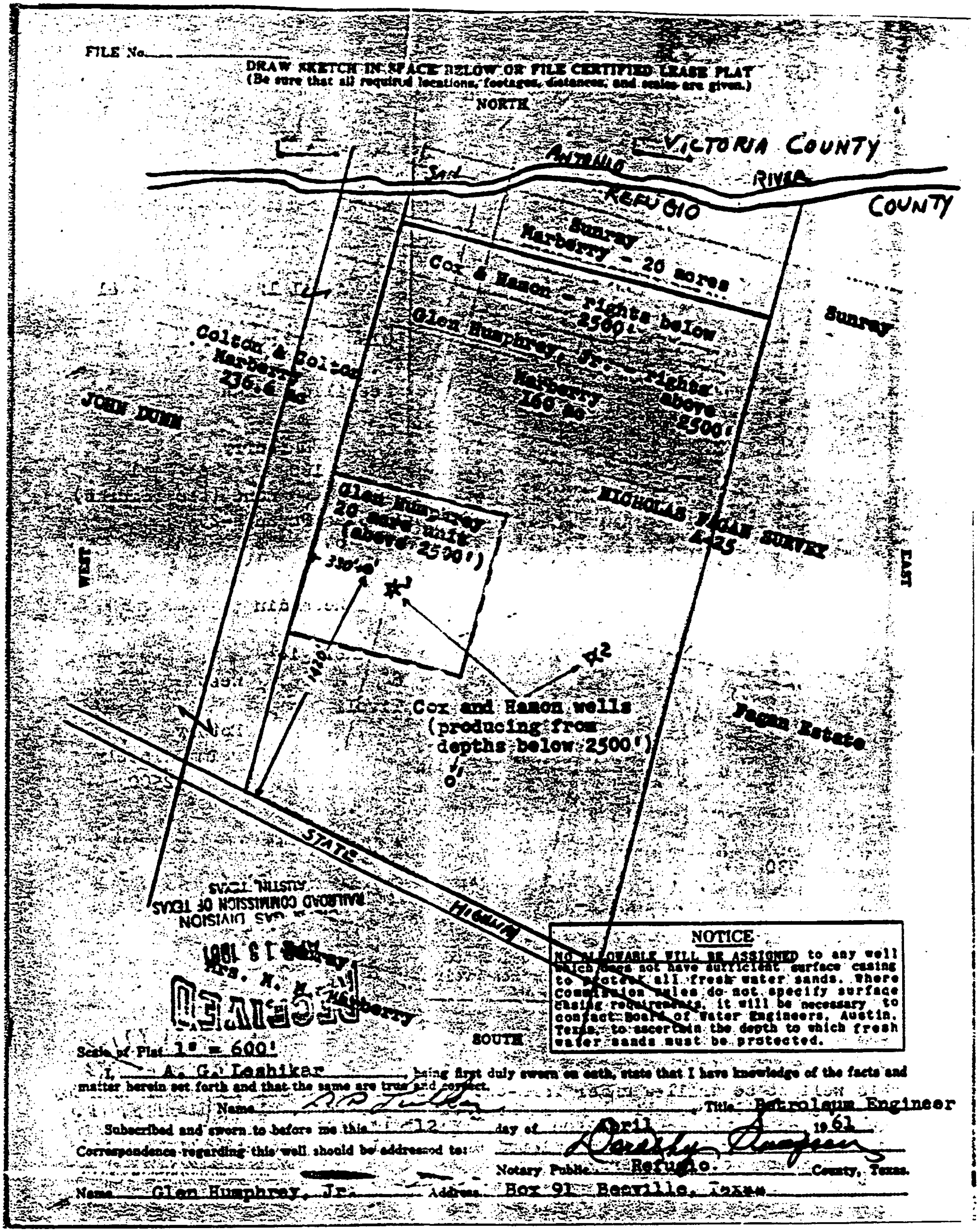
Is the acreage on which this well is to be located presently assigned to another well in any reservoir for which this permit is requested? NO

NOTICE: Before sending in this form be sure that you have given all information requested. Much unnecessary correspondence will thus be avoided.

DRAW SKETCH AND MAKE AFFIDAVIT ON REVERSE SIDE

This well to be drilled under farm-out agreement from Cox and Hamon whereby they retain all production and rights below 2500 feet. Glen Humphrey, Jr. has shallow rights down to 2500 feet. This well will not be completed in any sand that is presently completed and capable of production in the Cox and Hamon No. 3 Marberry.

Figure 3.36: Example of Form 1 from TRRC files.



FILE No.

DRAW SKETCH IN SPACE BELOW OR FILE CERTIFIED LEASE PLAT
(Be sure that all required locations, footages, distances, and scales are given.)

NORTH

VICTORIA COUNTY

ANTONIO RIVER

REFUGIO COUNTY

Sunray Marberry - 20 acres

Cox & Hamon - rights below 2500'

Glen Humphrey, Jr. - rights above 2500'

Marberry 160 ac

Sunray

Colton & Colton Marberry 236.6 ac

JOHN DUNN

NICHOLAS FAGAN SURVEY A-25

Glen Humphrey 20 acre unit (above 2500')

330'

WEST

EAST

Cox and Hamon wells (producing from depths below 2500')

Fagan Estate

STATE HIGHWAY

RAILROAD COMMISSION OF TEXAS
AUSTIN, TEXAS

Sunray Mrs. M. M. Marberry

SOUTH

NOTICE

NO ALLOWABLE WILL BE ASSIGNED to any well which does not have sufficient surface casing to protect all fresh water sands. Where Commission rules do not specify surface casing requirements, it will be necessary to contact Board of Water Engineers, Austin, Texas, to ascertain the depth to which fresh water sands must be protected.

Scale of Plat 1" = 600'

I, A. G. Leshikar, being first duly sworn on oath, state that I have knowledge of the facts and matter herein set forth and that the same are true and correct.

Name ______ Title Petroleum Engineer

Subscribed and sworn to before me this 12 day of April 1961

Correspondence regarding this well should be addressed to:

Notary Public Refugio County, Texas.

Name Glen Humphrey, Jr. Address Box 91 Beeville, Texas

Figure 3.36: Example of Form 1 from TRRC files. (page 2)

41060

· Please Refer to File No. ______

**RAILROAD COMMISSION OF TEXAS**
**OIL AND GAS DIVISION**

Form 2A
Application
To Plug and
Well Record

FILE IN DUPLICATE WITH DEPUTY SUPERVISOR OF DISTRICT IN WHICH WELL IS LOCATED FIVE FULL DAYS PRIOR TO PLUGGING.

Company: Glen Humphrey, Jr. Address: Beeville, Texas

Sec. No. ______ Block No. ______ Survey: Nicholas Fagan County: Refugio

Well No. 1 Name of Lease: Marberry No. of Acres: 160 Elev. 70' DF

Name of Field in which well is located: McFaddin

Located 8 Miles West Direction from Tivoli (Nearest P. O. or Town)

Form 1. "Notice of Intention to Drill," was filed in name of: Glen Humphrey, Jr.

Drilling Commenced: April 28, 1961. Drilling Completed: May 4, 1961

Has this well ever produced Oil? No or Gas? No

Character of Well (Oil, Gas or Dry): Dry Total Depth: 2354

Date you wish to Plug: May 4, 1961.

Name of Party Plugging Well: Dowell Inc. Address: Victoria, Texas

Correspondence regarding this well should be sent to: Name: Glen Humphrey, Jr.

Address: P. O. Box 91 Beeville, Texas

Initial Production of Gas: Volume (MCF) — 24 hrs. Pressure — lbs. per square inch

Initial Production of Oil: Barrels —

Give notice before Plugging to all available Lease Owners, as required by Rule (10).

When Plugging completed, file final Plugging Report, duly signed and sworn to. All necessary forms will be furnished by the Deputy Supervisor of district in which well is located.

NOTE: If no log available, so state and give all information that can be obtained as to total depth, whether or not cemented, producing formation, water sands, and as near as possible date well was drilled.

General Remarks:

RECEIVED
MAY 11 1961
RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION
REFUGIO, TEXAS

FILL OUT FORMATION AND AFFIDAVIT ON REVERSE SIDE

22-414

Figure 3.37: Example of a Form 2a from TRRC files.

FORMATION [illegible]RD

Show All Formations, Especially All Sands [illegible] Character and Contents Thereof

| FORMATIONS | TOP | BOTTOM | REMARKS |
|---|---|---|---|
| Surface sds & clays | 0 | 253 | |
| Fresh water sands | 253 | 1350 | |
| Shale | 1350 | 1408 | |
| Shaley sands | 1408 | 1660 | |
| Shale | 1660 | 1790 | |
| Shaley sands | 1790 | 1854 | |
| Shale | 1854 | 1985 | |
| Sand | 1985 | 2012 | |
| Shale | 2012 | 2060 | |
| Sand | 2060 | 2082 | |
| Shale | 2082 | 2290 | |
| Sand | 2290 | 2320 | |
| Shale | 2320 | 2354 | TD |

Method of shutting off water Cement Is water completely shut off? Yes

Amount of water with oil [illegible] per cent [illegible]

I, A. G. Leshikar [illegible] being first duly sworn on oath state that I have knowledge of the facts and matter herein set forth and that the same are true and correct.

[signature]
Representative of Company.

Subscribed and sworn to before me this [illegible] day of May, 19 61

[signature]
Notary Public

Refugio County, Texas.

Figure 3.37: Example of a Form 2a from TRRC files. (page 2)

41060

Please Refer to
File No. ______

RAILROAD COMMISSION OF TEXAS
OIL AND GAS DIVISION

Form 4
Plugging Record

FILE IN DUPLICATE WITH DEPUTY SUPERVISOR OF DISTRICT IN WHICH WELL IS LOCATED

Company Glen Humphrey, Jr. Address Box 91 Beeville, Texas

Sec. No. ______ Block No. ______ Survey Nicholas Fagan County Refugio

Well No. 1 Name of Lease Marberry No. of Acres 160

Name of Field in which well is located McFaddin Date well was plugged May 4, 1961

Form 1 (Notice of Intention to Drill) Was Filed in Name of Glen Humphrey, Jr.

Character of Well at the time of completion: Oil no bbls; Gas no Cu. Ft.; Dry yes
(Initial Production) (Initial Production)

Amount well producing when plugged: Oil - bbls; Gas - Cu. Ft.; Water - bbls.

Has this well ever produced oil or gas? No

Total Depth 2354 feet. Top of each producing sand none feet.

Was the well filled with mud-laden fluid, according to regulations of the Railroad Commission? Yes

How was mud applied? Circulated through drill pipe

Were plugs used? Yes If so, show all shoulders left for casing, depth of each, and size of casing, size and kind of plugs used and depth placed. Also amount of cement and rock. Was well shot? No

Cement plugs from 1680 to 1580 feet; from 300 to 200 feet and from 10 feet to surface.

| SIZE PIPE | PUT IN WELL | | PULLED OUT | | LEFT IN WELL | | PACKERS AND SHOES |
|---|---|---|---|---|---|---|---|
| | Ft. | In. | Ft. | In. | Ft. | In. | |
| 8 5/8 | 247 | | | | 247 | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Show depth found and thickness of all water, oil and gas formations Fresh water sands from 1660 to 253 feet

Have all abandoned wells on this lease been plugged according to Commissions rules? Yes

Manner of confining all oil, gas or water to strata: cement plugs and mud-laden fluid

The names of adjacent lease, royalty and landowners with their addresses in each instance as follows:

Cox and Hamon Dallas, Texas
Colton and Colton San Antonio, Texas
Sunray-Midcontinent Corpus Christi, Texas
M. M. Marberry Tivoli, Texas

RECEIVED
MAY 11 1961
RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION
REFUGIO, TEXAS

Was notice given before plugging to all available adjacent lease owners as required by Rule 10? Yes

I, A. G. Leshikar, being first duly sworn on oath, state that I have knowledge of the facts and the matter herein set forth and that the same are true and correct.

Name A. G. Leshikar Title Petroleum Engineer

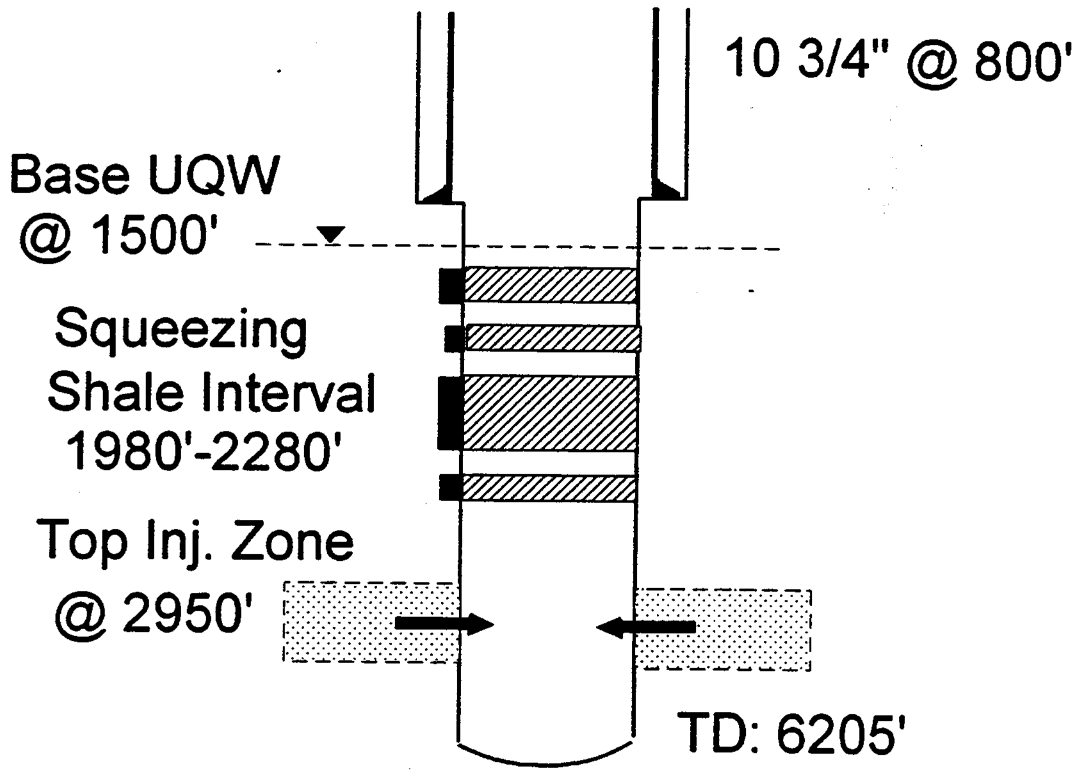
Subscribed and sworn to before me this 10 day of May, 1961

Maye Allen Leshikar
Notary Public Refugio County, Texas

Correspondence regarding this well should be addressed to:

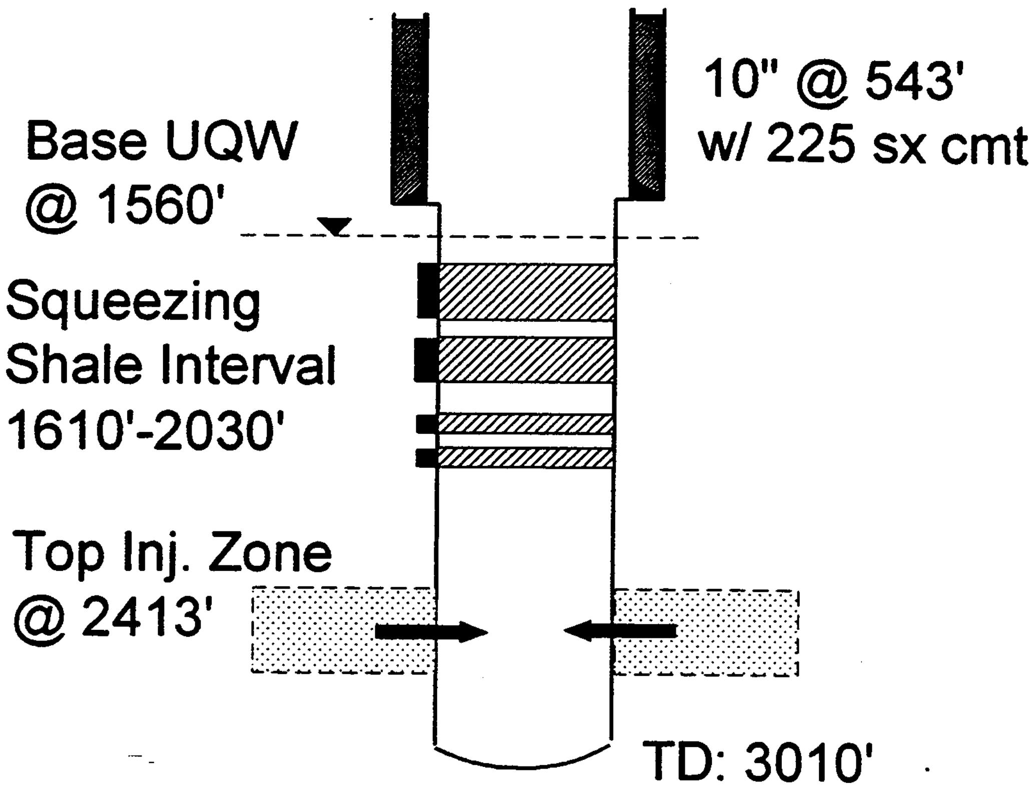
Name Glen Humphrey, Jr. Address P. O. Box 91 Beeville, Texas

Figure 3.38: Example of a Form 4 from TRRC files.



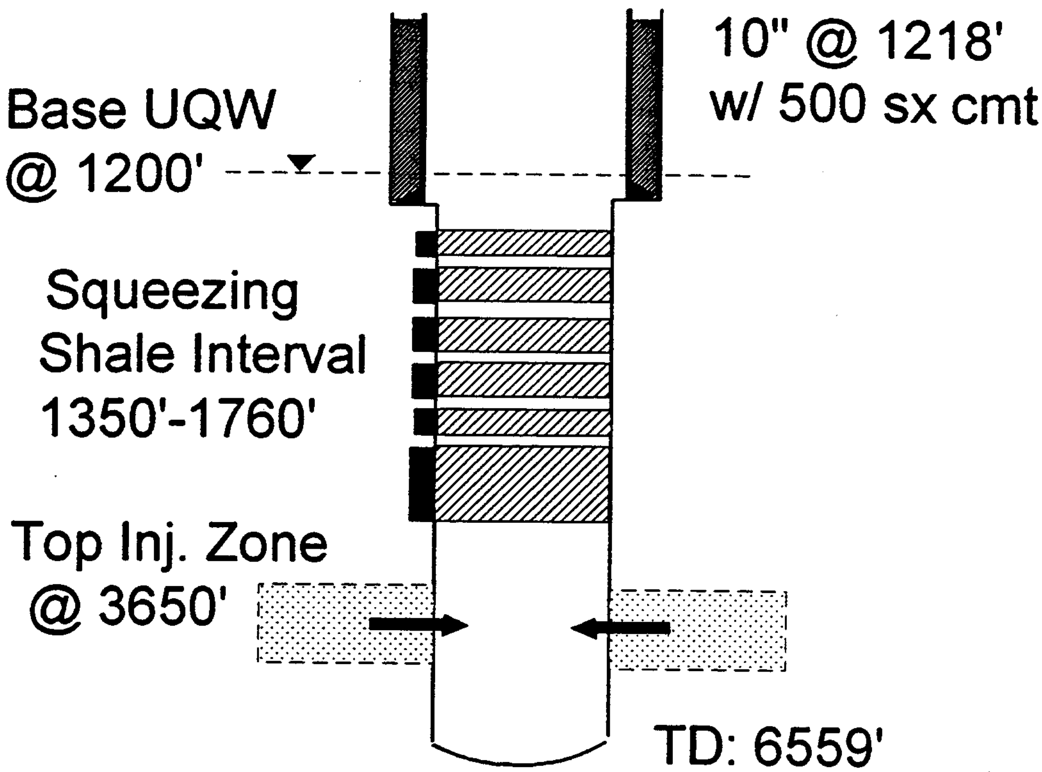

County: Refugio
Field: Tom O'Connor
Lease Name: Lambert M. F.
Well API Number: 391-01350
Completion Date: 7/19/38    Drilling Date: 6/21/38
Status At Completion: Dry
Conversions During Life: P&A

Figure 3.39



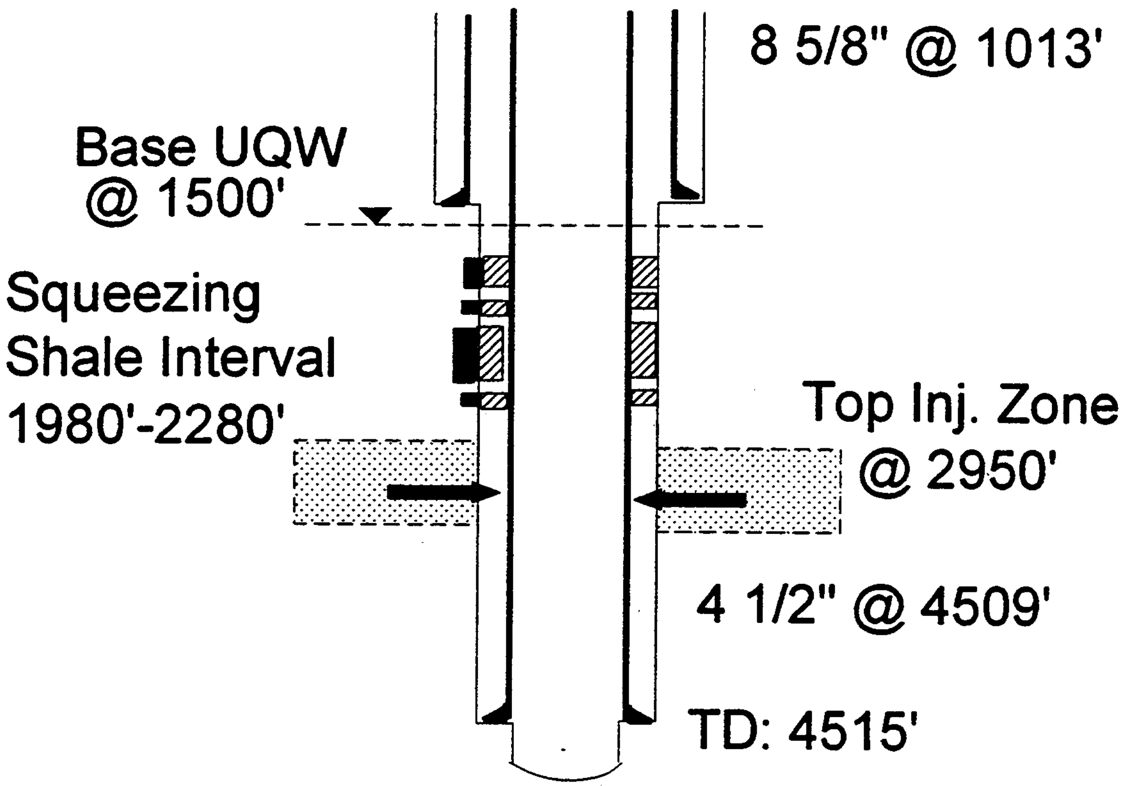

County: Victoria
Field: Coletto Creek
Lease Name: Dietzel Wm.
Well API Number: 469-01124
Completion Date: 4/2/36    Drilling Date: 3/13/36
Status At Completion: Dry
Conversions During Life: P&A

Figure 3.40



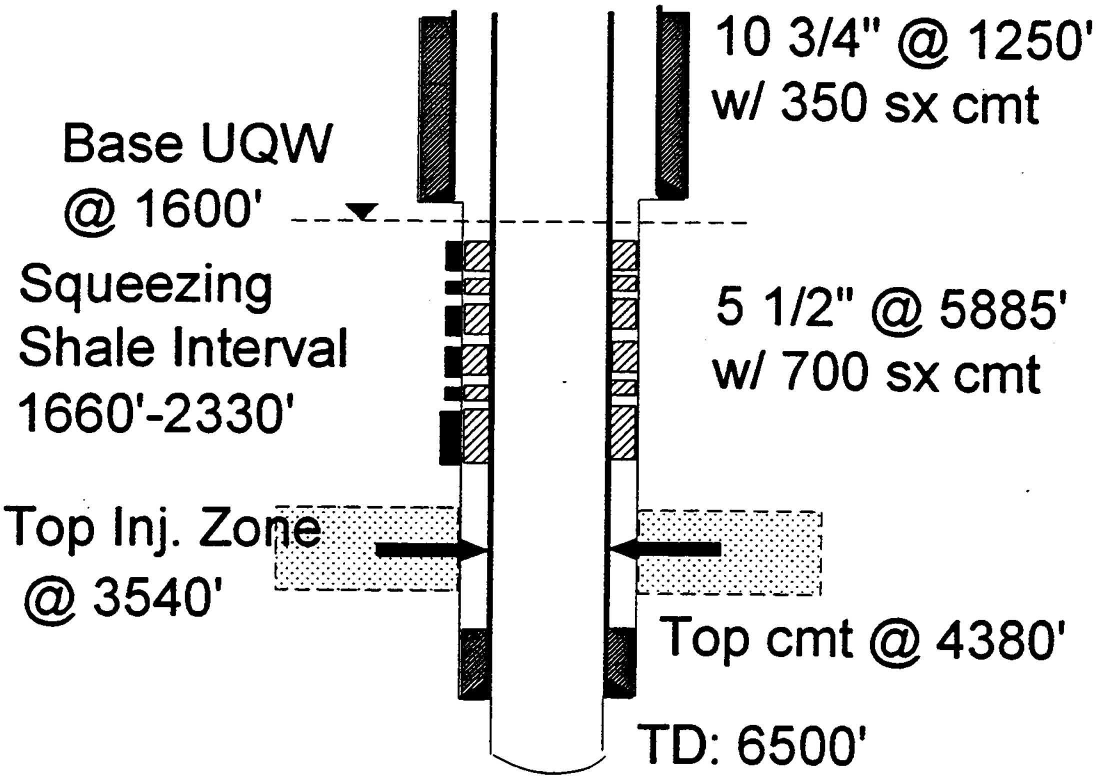

County: Refugio
Field: Bonnie View
Lease Name: C. Arnold
Well API Number: 391-03712
Completion Date: 2/4/36 Drilling Date: 12/15/35
Status At Completion: Dry
Conversions During Life: P&A 2/4/36

Figure 3.41




County: Refugio
Field: Tom O'Connor
Lease Name: Thomas O'Connor
Well API Number: 391-03804
Completion Date: 12/?/63    Drilling Date: 7/12/63
Status At Completion: Dry
Conversions During Life: P&A

Figure 3.42




County: Jackson
Field: West Ranch
Lease Name: E. H. Duenow
Well API Number: 239-02289
Completion Date: 6/4/52 Drilling Date: 5/10/52
Status At Completion: Dry
Conversions During Life: P&A

Figure 3.43

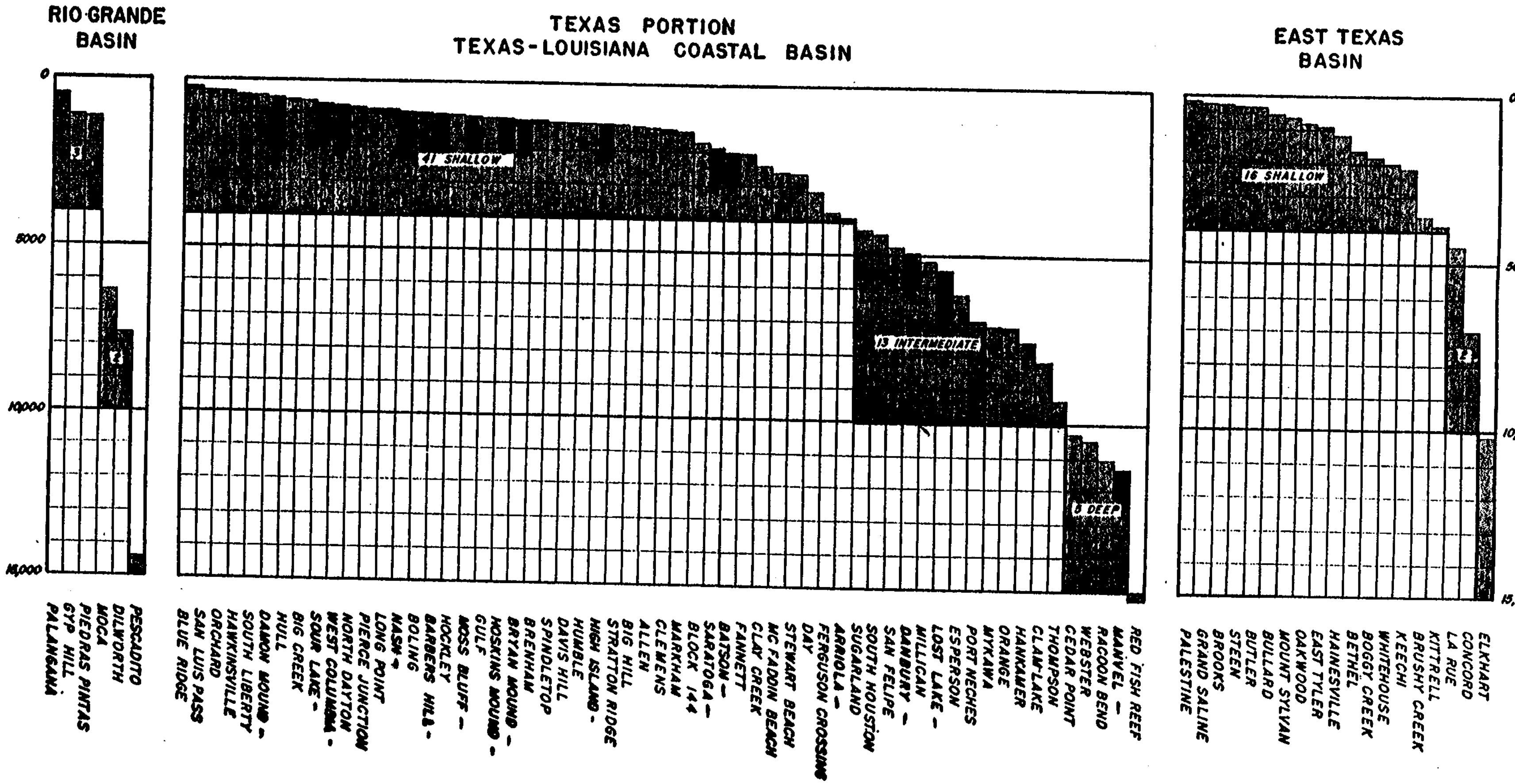



Table 3.1: Depth of burial for salt domes of the Texas and Louisiana Gulf Coast. From Halbouty[14].

| SYSTEM/ SERIES | GROUP/Formation NAMES | SHALLOW AND UPDIP (AQUIFERS) | DEEP AND DOWNDIP (OILFIELDS) |
|---|---|---|---|
| HOLOCENE | Alluvium | | |
| PLEISTOCENE | Beaumont<br>Lissie | Chicot<br>Aquifer | |
| PLIOCENE | Willis | | |
| MIOCENE | **Goliad Fm.**<br>**FLEMING GROUP**<br>**Lagarto Fm.**<br>**Oakville Fm.** | Evangeline Aquifer<br><br>Burkeville Confining<br>Jasper Aquifer | <br><br>Minor production<br>Minor production |
| OLIGOCENE | CATAHOULA GROUP<br>Anahuac<br>**Frio Fm.**<br>Vicksburg | Catahoula Confining<br>Not present<br>Not present<br>Vicksburg Confining | Minor production<br>MAJOR SHALE<br>**MAJOR PRODUCTION**<br>Significant production |
| EOCENE | JACKSON GROUP<br>CLAIBORNE GROUP<br>Yegua Fm.<br>Cook Mountain<br>Sparta Sand<br>Weches Fm.<br>Queen City<br>Reklaw Fm.<br>Carrizo Sand<br>WILCOX GROUP | Jackson Confining<br><br>U. Claiborne Aquifer<br>M. Claiborne Confining<br>Sparta Aquifer<br><br>Queen City Aquifer<br>L. Claiborne Confining<br>CARRIZO-WILCOX MAJOR<br>AQUIFER | Significant production<br><br>Significant production<br><br>Minor production<br><br>Minor production<br><br>Minor production<br>Minor production |
| PALEOCENE | MIDWAY GROUP | Midway Confining | Minor production |
| CRETACEOUS | 15 formations | | Significant production |
| JURASSIC | 5 formations including Louann Salt | | |
| TRIASSIC | Eagle Mills | | |
| PALEOZOIC | | | Ouachita Facies |

**Table 3.2: Texas Gulf Coast stratigraphic nomenclature. Oil field information from Galloway[16], aquifer and confining layer data from Ryder and Ardis[17], and Tertiary Series boundaries updated from Galloway[23].**

**Table 3.3: Field types, discovery dates and depth to principal producing horizons for the 73 injection fields of this study. Data from Galloway[16], Halbouty[14], and Kosters[19]. Where different discovery dates were reported, the earlier date is recorded here.**

| STRATIGRAPHIC NOTATIONS | |
|---|---|
| FL | = FLUVIAL |
| BI | = BARRIER ISLAND |
| SP | = STRAND PLAIN |
| DEL | = DELTA |

| STRUCTURAL NOTATIONS | |
|---|---|
| FLT | = FAULTED |
| PART | = PARTLY PRODUCTIVE |
| SSD | = SHALLOW SALT DOME |
| ISD | = INTERMEDIATE SALT DOME |
| DSD | = DEEP SALT DOME |
| TCR | = TOP CAP ROCK DEPTH |
| TS | = TOP SALT DEPTH |

| COUNTY & FIELD | DISC DATE | DEPTH | PRINCIPAL PRODUCING HORIZON | TRAP TYPE |
|---|---|---|---|---|
| REFUGIO COUNTY | | | | |
| Bonnie View | 1944 | 4500 | FRIO BI-SP | ANTICLINE |
| Greta | 1933 | 4400 | FRIO BI-SP | FLT-ANTICLINE |
| La Rosa | 1938 | 5700 | FRIO BI-SP | FLT-ANTICLINE |
| Lake Pasture | 1959 | 4500 | FRIO BI-SP | ANTICLINE |
| McFaddin | 1938 | 4400 | FRIO BI-SP | ANTICLINE |
| Mary E O'Connor | 1953 | 5900 | FRIO BI-SP | ANTICLINE |
| New Refugio | <71 | 5500 | FRIO BI-SP | |
| Old Refugio | | | | |
| Tom O'Connor | 1934 | 5100 | FRIO BI-SP | FLT-ANTICLINE |
| BRAZORIA COUNTY | | | | |
| Bryan Mound | 1935 | | MIOCENE | SSD, TCR = 680 |
| Damon Mound | 1915 | | FRIO, MIOC | SSD, TCR = 529 |
| Damon Mound E. | | | | |
| Danbury | 1930 | | FRIO DEL, MIOC | ISD, TS = 4948 |
| Hastings E. | 1934 | 6100 | FRIO | DSD |
| Hoskins Mound | 1904 | | | SSD, TC = 574 |
| Lochridge | 1936 | 6325 | FRIO DEL | FANT |
| Manvel | 1931 | 5400 | FRIO | DSD, TS = 11,274 |
| Nash Dome | | | | SSD, TCR = 620 |
| West Columbia | 1904 | | MIOCENE, FRIO | SSD, TCR = 650 |
| Old Ocean | 1934 | 9600 | FRIO BI-SP | FLT-ANTICLINE |
| CHAMBERS COUNTY | | | | |
| Anahuac | 1935 | 7100 | FRIO DEL | DSD |
| Barbers Hill | 1916 | | MIOCENE-PLIO | SSD, TCR = 350 |
| Fig Ridge | 1941 | 8500 | FRIO DEL | DSD |
| High Island | 1922 | | MIOCENE, FRIO | SSD, TCR= 150 |
| Lost Lake | 1929 | | FRIO | ISD, TS = 5430, TCR=3272 |
| Moss Bluff | 1926 | | | SSD, TCR = 591 |
| Oyster Bayou | 1929 | 8300 | FRIO | DSD |
| Stowell | | | FRIO BI-SP | |
| HARDIN COUNTY | | | | |
| Arriola | 1928 | | MIOCENE-PLIO | SSD, TS = 3,929 |
| Batson New | | | | |

Table 3.3: (con't)

| | | | | |
|---|---|---|---|---|
| Batson Old | 1903 | | FRIO, YEGUA | SSD, TCR = 1,080 |
| Saratoga | 1901 | | YEGUA | SSD, TCR = 1,500 |
| Saratoga W. | | | | |
| Sour Lake | 1902 | VAR | FRIO-YEGUA | SSD, TCR = 660 |
| JACKSON COUNTY | | | | |
| Cordele | | | | |
| Ganado | 1940 | 6200 | FRIO BI-SP | FLT-ANTICLINE |
| Ganado W. | 1940 | 4700 | FRIO BI-SP | FLT-ANTICLINE |
| La Ward N. | 1941 | 5200 | FRIO BI-SP | ANTICLINE |
| Lolita | 1940 | 5600 | FRIO BI-SP | |
| Maurbro | 1941 | 5200 | FRIO BI-SP | FLT-ANTICLINE |
| Stewart | | | | |
| West Ranch | 1939 | 5600 | FRIO BI-SP | ANTICLINE |
| NUECES COUNTY | | | | |
| Agua Dulce | 1942 | 5700 | FRIO | COMBINATION |
| Baldwin | | | | |
| Clara Driscoll | | | | |
| London Gin | 1949 | 4500 | FRIO BI-SP | PART |
| Richard King | | | | |
| Saxet | 1944 | 5000 | FRIO BI-FL | FLT-ANTICLINE |
| White Point E. | 1938 | 5700 | FRIO BI-SP | FLT-ANTICLINE |
| SAN PATRICIO COUNTY | | | | |
| Midway | <42 | 5500 | FRIO BI-SP | COMBINATION |
| Odem | <46 | VAR | SINTON | |
| Plymouth | 1936 | 5600 | FRIO BI-SP | |
| Plymouth E. | | | | |
| Portilla | 1950 | 7300 | FRIO BI-SP | ANTICLINE |
| Sinton W. | | | | |
| Taft | 1935 | 4000 | FRIO BI-SP | |
| White Point E. | 1938 | 5700 | FRIO BI-SP | FLT-ANTICLINE |
| STARR COUNTY | | | | |
| Garcia | 1942 | 3800 | FRIO FL-DEL | FLT-ANTICLINE |
| Jay Simmons | | | | |
| Kelsey S. | 1941 | 4700 | FRIO FL-DEL | FLT-ANTICLINE |
| Reyna | | | | |
| Ricaby | <54 | 1500 | FRIO, VICKS | |
| Rincon | 1940 | 4500 | FRIO FL-DEL | FLT-ANTICLINE |
| Sun | 1941 | 4300 | FRIO FL-DEL | COMBINATION |
| Sun N. | 1942 | 4400 | FRIO FL-DEL | COMBINATION |
| VICTORIA COUNTY | | | | |
| Bloomington | 1947 | 4600 | FRIO BI-SP | FLT-ANTICLINE |
| Coletto Creek | 1962 | 3000 | FRIO FL-DEL | FLT-ANTICLINE |
| Helen Gohlke | 1950 | 8100 | WLCX FL-DEL-BI | FLT-ANTICLINE |
| Helen Gohlke W. | 1953 | 8200 | WILCOX FL-DEL | FLT-ANTICLINE |
| Heyser | 1936 | 5400 | FRIO BI-SP | COMBINATION |
| Keeran | <54 | VAR | | |
| McFaddin | 1938 | 4400 | FRIO BI-SP | COMBINATION |
| Placedo | 1937 | 4700 | FRIO BI-SP | FLT-ANTICLINE |
| Placedo E. | | | | |
| Pridham Lake | | | | |

Table 3.4: TRRC Well Counts from OGWBS for Selected Fields in Refugio County

| Field | Total Wells | Wells w/ Locations | Plugged Wells | Injectors | Producers |
|---|---|---|---|---|---|
| Bonnie View | 101 | 86 | 48 | 2 | 31 |
| No Dates | 20 | 10 | 5 | 1 | 4 |
| Pre-1967 | 16 | 14 | 1 | 0 | 12 |
| 1967-1982 | 27 | 25 | 13 | 0 | 8 |
| Post-1982 | 38 | 37 | 29 | 1 | 7 |
| Greta | 332 | 296 | 106 | 10 | 163 |
| No Dates | 81 | 56 | 9 | 0 | 46 |
| Pre-1967 | 36 | 34 | 3 | 1 | 26 |
| 1967-1982 | 84 | 81 | 12 | 6 | 56 |
| Post-1982 | 131 | 125 | 82 | 3 | 35 |
| Lake Pasture | 422 | 341 | 22 | 8 | 290 |
| No Dates | 106 | 30 | 1 | 1 | 28 |
| Pre-1967 | 75 | 73 | 3 | 1 | 64 |
| 1967-1982 | 154 | 151 | 8 | 5 | 130 |
| Post-1982 | 87 | 87 | 10 | 1 | 68 |
| LaRosa | 100 | 91 | 29 | 3 | 53 |
| No Dates | 15 | 8 | 5 | 0 | 3 |
| Pre-1967 | 40 | 40 | 1 | 2 | 33 |
| 1967-1982 | 22 | 21 | 3 | 0 | 16 |
| Post-1982 | 23 | 22 | 20 | 1 | 1 |
| McFaddin | 75 | 56 | 16 | 0 | 30 |
| No Dates | 16 | 2 | 1 | 0 | 1 |
| Pre-1967 | 13 | 12 | 1 | 0 | 6 |
| 1967-1982 | 30 | 26 | 7 | 0 | 15 |
| Post-1982 | 16 | 16 | 7 | 0 | 8 |
| Mary Ellen O'Connor | 259 | 233 | 114 | 4 | 106 |
| No Dates | 55 | 38 | 24 | 0 | 14 |
| Pre-1967 | 36 | 35 | 6 | 1 | 24 |
| 1967-1982 | 88 | 80 | 22 | 3 | 53 |
| Post-1982 | 80 | 80 | 62 | 0 | 15 |

Table 3.4: Continued

| | | | | | |
|---|---|---|---|---|---|
| Refugio New | 88 | 67 | 24 | 0 | 41 |
| No Dates | 40 | 20 | 5 | 0 | 14 |
| Pre-1967 | 11 | 10 | 1 | 0 | 8 |
| 1967-1982 | 20 | 20 | 7 | 0 | 13 |
| Post-1982 | 17 | 17 | 11 | 0 | 6 |
| Refugio Old | 99 | 77 | 47 | 1 | 19 |
| No Dates | 32 | 14 | 3 | 0 | 8 |
| Pre-1967 | 8 | 8 | 1 | 0 | 4 |
| 1967-1982 | 15 | 13 | 5 | 1 | 4 |
| Post-1982 | 44 | 42 | 38 | 0 | 3 |
| Tom O'Connor | 1336 | 1065 | 110 | 26 | 890 |
| No Dates | 494 | 238 | 4 | 1 | 230 |
| Pre-1967 | 190 | 183 | 12 | 7 | 146 |
| 1967-1982 | 344 | 337 | 18 | 9 | 297 |
| Post-1982 | 308 | 307 | 76 | 9 | 217 |

Table 3.5: Pre-1967 Abandoned Well Counts for Gulf Coast Study Counties from Petroleum Information

| County | Field | Pre-1967 # of Abandoned Wells |
|---|---|---|
| Brazoria | | 859 |
| | Bryan Mound | 29 |
| | Chocolate Bayou | 0 |
| | Damon Mound | 281 |
| | Damon Mound E | 1 |
| | Danbury | 107 |
| | Hastings East | 1 |
| | Hastings West | 0 |
| | Hoskins Mound | 39 |
| | Lochridge | 13 |
| | Manvel | 98 |
| | Nash Dome | 34 |
| | West Columbia | 236 |
| | West Columbia New | 0 |
| | Old Ocean | 17 |
| | Total in Selected Fields | 856 |
| | Total w/ locational data | 662 |
| Chambers | | 292 |
| | Anahuac | 44 |
| | Barbers Hill | 157 |
| | Fig Ridge | 12 |
| | High Island | 13 |
| | Lost Lake | 27 |
| | Moss Bluff | 12 |
| | Oyster Bayou | 15 |
| | Stowell | 12 |
| | Total in Selected Fields | 292 |
| | Total w/ locational data | 224 |

Table 3.5: Continued

| County | Field | Pre-1967 # of Abandoned Wells |
|---|---|---|
| Hardin | | 705 |
| | Arriola | 31 |
| | Batson New | 88 |
| | Batson Old | 129 |
| | Saratoga | 160 |
| | Saratoga West | 13 |
| | Sour Lake | 281 |
| | Village Mills E | 0 |
| | Total in Selected Fields | 702 |
| | Total w/ locational data | 520 |
| Jackson | | 190 |
| | Cordele | 24 |
| | Ganado | 18 |
| | Ganado W | 21 |
| | La Ward N | 33 |
| | Lolita | 26 |
| | Maurbro | 14 |
| | Stewart | 16 |
| | West Ranch | 38 |
| | Total in Selected Fields | 190 |
| | Total w/ locational data | 183 |
| Nueces | | 430 |
| | Agua Dulce | 156 |
| | Baldwin | 21 |
| | London Gin | 23 |
| | Richard King | 12 |
| | Saxet | 183 |
| | Clara Driscoll | 24 |
| | White Point E | 11 |
| | Total in Selected Fields | 430 |
| | Total w/ locational data | 319 |

Table 3.5: Continued

| County | Field | Pre-1967 # of Abandoned Wells |
|---|---|---|
| Refugio | | 919 |
| | Bonnie View | 22 |
| | Greta | 34 |
| | Lake Pasture | 3 |
| | McFaddin | 22 |
| | Mary Ellen O'Connor | 10 |
| | Refugio New | 3 |
| | Refugio Old | 12 |
| | Tom O'Connor | 28 |
| | Total in Selected Fields | 138 |
| | Total w/ locational data | 134 |
| San Patricio | | 266 |
| | Midway | 63 |
| | Odem | 19 |
| | Plymouth | 50 |
| | Plymouth E | 12 |
| | Portilla | 9 |
| | Sinton W | 55 |
| | Taft | 29 |
| | White Point E | 29 |
| | Total in Selected Fields | 266 |
| | Total w/ locational data | 181 |

Table 3.5: Continued

| County | Field | Pre-1967 # of Abandoned Wells |
| --- | --- | --- |
| Starr | | 349 |
| | Garcia | 52 |
| | Jay Simmons | 14 |
| | Kelsey S | 22 |
| | Reyna | 7 |
| | Ricaby | 37 |
| | Rincon | 115 |
| | Sun | 38 |
| | Sun N | 64 |
| | Total in Selected Fields | 349 |
| | Total w/ locational data | 328 |
| Victoria | | 164 |
| | Bloomington | 15 |
| | Coletto Creek | 25 |
| | Helen Gohlke | 10 |
| | Helen Gohlke W | 2 |
| | Heyser | 7 |
| | Keeran | 16 |
| | Koontz | 0 |
| | McFaddin | 15 |
| | Placedo | 34 |
| | Placedo E | 22 |
| | Pridham Lake | 18 |
| | Total in Selected Fields | 164 |
| | Total w/ locational data | 145 |

Table 3.6: Texas Railroad Commission Well Records

The following is a list of the Forms and other data sheets that were received from Banks Information Solutions in their search for TRRC file data on pre-67 wells. Also indicated is the information that was useful in this study on each form. The data that are present on each form are variable and even though the form has a data entry location, this does not guarantee that the data are present.

| Form # | Form Name | Information |
|---|---|---|
| Form 1 | Application to Drill or Deepen | Location of Well<br>Lease Name<br>Year Drilled |
| Form 2 | Well Record | Location of Well<br>Lease Name<br>Field Name<br>Type of Well<br>Dates, Drilled & Completed<br>Construction Data |
| Form 2A | Appl. to Plug and Well Record | Location of Well<br>Lease Name<br>Field Name<br>Type of Well<br>Dates: Drilled & Completed<br>Formations |
| Form 3 | Potential Test | Location of Well<br>Lease Name<br>Field Name<br>Type of Well<br>Date Completed<br>Surface and Production CSG<br>Tubing<br>Perforated Interval<br>Total Depth (PBTD) |
| Form 4 | Plugging Record | Location of Well<br>Lease Name<br>Field Name<br>Construction Data<br>Plugging Data<br>Formation Record<br>Total Depth |

Table 3.6: Continued

| | | |
|---|---|---|
| Form 15 | Appl. to Shoot or Treat w/Acid | Location of Well<br><br>Lease Name<br>Field Name<br>Stimulation Planned<br>Some Construction Data |
| Form 16 | Statement of the Condition of Well after Shoot or Treat | Location of Well<br>Lease Name<br>Stimulation Performed |
| Form W-1 | Application to Drill, Deepen, PB, or ReEnter | Location of Well<br>Lease Name<br>Field Name<br>Operator |
| Form W-1C | Compliance Certification | Filed with Form W-1 |
| Form W-2 | Oil Well Potential Test Completion, or Recompletion Report and Log | Location of Well<br>Lease Name<br>Field Name<br>Type of Well<br>Dates, Drilled & Completed<br>Construction Data<br>Tubing<br>Perf'd Interval<br>Total Depth (PBTD)<br>Formations |
| Form W-3 | Plugging Record | Location of Well<br>Lease Name<br>Field Name<br>Dates, Drilled & Comp. & Plug<br>Construction Data (No cmt)<br>Pulled Casing<br>Plugs<br>Bottom Fresh Water<br>Total Depth (PBTD) |
| Form W-15 | Cementing Report | Shows Cement Put in Hole (generally only plugs are reported on Form and is filed with Form W-3) |

Table 3.6: Continued

| | | |
|---|---|---|
| Form I-I | Inclination Report | Location of Well<br>Lease Name<br>Field Name |
| Form X-1313 | | Location of Well<br>Lease Name<br>Field Name |
| Form CD-MID | Condition of Hole and Procedure | Lease Name<br>Field Name<br>Workover Procedures<br>P&A Procedure & Data<br>Construction Data<br>Perforated Interval<br>Total Depth (PBTD)<br>Sketch of Wellbore |
| Rule 14 | Notice of P&A | Location of Well<br>Lease Name<br>Field Name<br>Construction Data<br>Perforated Interval<br>Plan for Plugging |
| | Proration Schedule | Current Status of Well |

| County | Field | API #'s | Current Status | Form 4 (W-3) | P&A Date |
|---|---|---|---|---|---|
| Refugio | | | | | |
| | Bonnie View | | | | |
| | | 391-03243 | P&A | Y | 8-30-78 |
| | | 391-03555 | P&A | Y | 3-17-72 |
| | | 391-03628 | P&A | Y | 8-25-79 |
| | | 391-03629 | P&A | Y | 8-29-79 |
| | | 391-03634 | P&A | Y | 5-4-82 |
| | | 391-03637 | P&A | Y | 9-2-79 |
| | | 391-03638 | P&A | Y | 9-4-79 |
| | | 391-03646 | P&A | Y | 2-19-71 |
| | | 391-03647 | P&A | Y | 2-19-71 |
| | | 391-80438 | P&A | Y | 12-5-77 |
| | | 391-80441 | Shut-In | na | na |
| | Greta | | | | |
| | | 391-00777 | Producer | na | na |
| | | 391-00782 | P&A | Y | 7-31-80 |
| | | 391-00790 | P&A | Y | 5-30-79 |
| | | 391-00792 | P&A | Y | 4-24-80 |
| | | 391-00795 | P&A | Y | 12-15-82 |
| | | 391-00798 | P&A | Y | 3-5-79 |
| | | 391-00805 | P&A | Y | 9-15-75 |
| | | 391-00870 | Producer | na | na |
| | | 391-00886 | P&A | Y | 4-26-95 |
| | | 391-00947 | P&A | Y | 12-19-78 |
| | | 391-00954 | P&A | Y | 12-11-81 |
| | | 391-00968 | P&A | Y | 9-30-82 |
| | | 391-00969 | P&A | Y | 6-23-72 |
| | | 391-01012 | P&A | Y | 11-1-72 |
| | | 391-01031 | Shut-In | na | na |
| | | 391-01032 | Shut-In | na | na |
| | | 391-01043 | P&A | Y | 6-11-75 |
| | | 391-01205 | Disposal | na | na |
| | | 391-03978 | P&A | Y | 10-6-82 |
| | | 391-80947 | P&A | Y | 3-18-76 |
| | | 391-80953 | P&A | Y | 10-16-72 |
| | | 391-82008 | P&A | Y | 12-5-83 |
| | Lake Pasture | | | | |
| | | 391-00180 | P&A | Y | 4-23-82 |
| | | 391-00358 | P&A | Y | 6-23-81 |
| | | 391-00464 | P&A | Y | 1-25-82 |
| | | 391-01890 | P&A | Y | 1-31-70 |
| | | 391-03635 | P&A | Y | 5-3-82 |
| | | 391-03780 | Shut-In | na | na |
| | | 391-03894 | P&A | Y | 4-25-88 |
| | | 391-30221 | Producer | na | na |
| | La Rosa | | | | |
| | | 391-03332 | P&A | Y | 1-5-78 |
| | | 391-03405 | P&A | Y | 10-21-71 |
| | | 391-03365 | Producer | na | na |
| | | 391-80450 | P&A | Y | 1-9-78 |
| | | 391-80713 | P&A | Y | 4-26-71 |
| | | 391-80810 | P&A | Y | 9-8-77 |
| | | 391-81023 | P&A | Y | 1-22-77 |
| | McFaddin | | | | |
| | | 391-00159 | P&A | Y | 6-18-82 |
| | | 391-00166 | Shut-In | na | na |
| | | 391-01946 | P&A | Y | 12-30-80 |
| | | 391-30178 | P&A | Y | 4-21-82 |

Table 3.7: Data for post-1966 Refugio County abandoned wells. Wells identified from TRRC OGWBS database. Data from TRRC files.

| | | | | | |
|---|---|---|---|---|---|
| | | 391-80701 | P&A | Y | 8-9-73 |
| | | 391-80908 | P&A | Y | 6-8-79 |
| | | 391-80911 | P&A | Y | 8-22-73 |
| | | | | | |
| | Mary Ellen O'Connor | | | | |
| | | 391-01799 | P&A | Y | 1-31-75 |
| | | 391-01820 | Disposal | na | na |
| | | 391-01821 | P&A | Y | 4-2-73 |
| | | 391-01831 | P&A | Y | 5-25-73 |
| | | 391-01832 | P&A | Y | 1-19-73 |
| | | 391-01844 | P&A | Y | 5-30-73 |
| | | 391-01845 | P&A | Y | 5-29-73 |
| | | 391-01859 | P&A | Y | 3-7-73 |
| | | 391-01860 | P&A | Y | 3-3-73 |
| | | 391-01874 | P&A | Y | 7-24-73 |
| | | 391-01892 | Producer | na | na |
| | | 391-01896 | P&A | Y | 8-2-73 |
| | | 391-01897 | P&A | Y | 2-18-72 |
| | | 391-01898 | P&A | Y | 12-10-81 |
| | | 391-01908 | P&A | Y | 10-24-79 |
| | | 391-01909 | P&A | Y | 7-25-73 |
| | | 391-01910 | P&A | Y | 10-30-79 |
| | | 391-01911 | Shut-In | na | na |
| | | 391-01912 | P&A | Y | 12-17-82 |
| | | 391-01927 | Producer | na | na |
| | | 391-01928 | P&A | Y | 9-11-76 |
| | | 391-01930 | P&A | Y | 12-1-82 |
| | | 391-01935 | P&A | Y | 2-23-72 |
| | | 391-01937 | Producer | na | na |
| | | 391-01941 | P&A | Y | 7-8-72 |
| | | 391-01945 | P&A | Y | 9-24-90 |
| | | 391-01946 | P&A | Y | 12-30-80 |
| | | 391-01949 | Shut-In | na | na |
| | | 391-01950 | P&A | Y | 7-1-72 |
| | | 391-01951 | P&A | Y | 4-11-72 |
| | | 391-01955 | P&A | Y | 4-6-72 |
| | | 391-01956 | P&A | Y | 3-10-72 |
| | | 391-01960 | P&A | Y | 11-2-79 |
| | | 391-01962 | P&A | Y | 4-13-82 |
| | | 391-02800 | P&A | Y | 4-5-68 |
| | | 391-02833 | P&A | Y | 7-8-67 |
| | | 391-03220 | P&A | Y | 11-12-79 |
| | | 391-03232 | P&A | Y | 3-27-72 |
| | | 391-03235 | P&A | Y | 4-17-80 |
| | | 391-03243 | P&A | Y | 8-30-78 |
| | | 391-03729 | P&A | Y | 12-4-81 |
| | | 391-03805 | P&A | Y | 3-16-79 |
| | | 391-04028 | P&A | Y | 11-8-72 |
| | | 391-04045 | P&A | Y | 11-20-78 |
| | | 391-30575 | P&A | Y | 2-19-82 |
| | | 391-31230 | P&A | Y | 12-18-82 |
| | | 391-80805 | P&A | Y | 2-28-73 |
| | | | | | |
| | Refugio New | | | | |
| | | 391-03015 | P&A | Y | 2-28-73 |
| | | 391-03046 | P&A | Y | 10-5-78 |
| | | 391-03323 | P&A | Y | 11-7-79 |
| | | 391-80520 | P&A | Y | 11-7-75 |
| | | 391-80722 | P&A | Y | 6-22-78 |
| | | 391-80732 | P&A | Y | 4-7-71 |
| | | 391-80734 | P&A | Y | 3-18-71 |
| | | 391-80736 | P&A | Y | 8-9-93 |
| | | 391-80737 | P&A | Y | 6-27-78 |
| | | 391-80741 | P&A | Y | 6-27-78 |
| | | | | | |
| | Refugio Old | | | | |
| | | 391-02318 | P&A | Y | 4-27-75 |

Table 3.7: Continued

| | | | | | |
|---|---|---|---|---|---|
| | | 391-02467 | P&A | Y | 5-14-82 |
| | | 391-02470 | P&A | Y | 5-11-82 |
| | | 391-02474 | P&A | Y | 12-10-76 |
| | | 391-02498 | Temp. A. | na | na |
| | | 391-02647 | P&A | Y | 12-4-71 |
| | | 391-80539 | P&A | Y | 5-18-74 |
| | | 391-80540 | P&A | Y | 4-8-75 |
| | | | | | |
| | Tom O'Connor | | | | |
| | | 391-00420 | Shut-In | na | na |
| | | 391-00464 | P&A | Y | 1-25-82 |
| | | 391-00474 | Shut-In | na | na |
| | | 391-00670 | P&A | Y | 7-18-77 |
| | | 391-00736 | Producer | na | na |
| | | 391-00765 | P&A | Y | 3-20-80 |
| | | 391-01476 | Producer | na | na |
| | | 391-01526 | Shut-In | na | na |
| | | 391-02023 | Shut-In | na | na |
| | | 391-02026 | Shut-In | na | na |
| | | 391-02032 | Disposal | na | na |
| | | 391-03046 | P&A | Y | 10-5-78 |
| | | 391-03803 | P&A | Y | 8-18-71 |
| | | 391-80115 | P&A | Y | 8-12-74 |
| | | 391-80320 | P&A | Y | 2-5-82 |
| | | 391-80636 | P&A | Y | 6-21-88 |
| | | 391-81159 | Shut-In | na | na |
| | | 391-82075 | P&A | Y | 8-30-82 |

Table 3.7: Continued

Post '66 Wells - Summary

| County | Field | Total Wells | Not Abd. | No Int. | Post '66 P&A | Post '66 P&A w/ Form 4 | Post '66 P&A No Form4 |
|---|---|---|---|---|---|---|---|
| Refugio | | | | | | | |
| | Bonnie View | 11 | 1 | 0 | 10 | 10 | 0 |
| | Greta | 22 | 5 | 0 | 17 | 17 | 0 |
| | Lake Pasture | 8 | 2 | 0 | 6 | 6 | 0 |
| | La Rosa | 7 | 1 | 0 | 6 | 6 | 0 |
| | McFaddin | 7 | 1 | 0 | 6 | 6 | 0 |
| | Mary Ellen O'Connor | 47 | 6 | 0 | 41 | 41 | 0 |
| | Refugio New | 10 | 0 | 0 | 10 | 10 | 0 |
| | Refugio Old | 8 | 1 | 0 | 7 | 7 | 0 |
| | Tom O'Connor | 18 | 9 | 0 | 9 | 9 | 0 |
| | TOTAL | 138 | 26 | 0 | 112 | 112 | 0 |

Table 3.8: Summary of data for post-1966 Refugio County abandoned wells. Wells identified from TRRC OGWBS database. Data from TRRC files.

| County | Field | Total Wells | Not Abd. | No Int. | Post '66 P&A | Pre '67 P&A w/ Form 4 | Possible Pre '67 P&A No Form4 |
|---|---|---|---|---|---|---|---|
| Refugio | | | | | | | |
| | Bonnie View | 20 | 0 | 0 | 2 | 17 | 1 |
| | Greta | 28 | 5 | 0 | 2 | 13 | 8 |
| | Lake Pasture | 8 | 0 | 0 | 0 | 7 | 1 |
| | La Rosa | 21 | 0 | 0 | 0 | 21 | 0 |
| | McFaddin | 4 | 0 | 0 | 0 | 4 | 0 |
| | Mary Ellen O'Connor | 10 | 0 | 0 | 2 | 8 | 0 |
| | Refugio New | 3 | 0 | 0 | 0 | 3 | 0 |
| | Refugio Old | 12 | 0 | 1 | 1 | 9 | 2 |
| | Tom O'Connor | 28 | 2 | 0 | 1 | 18 | 7 |
| | TOTAL | 134 | 7 | 1 | 8 | 100 | 19 |

Table 3.9: Summary of data for pre-1967 Refugio County abandoned wells. Wells identified from PI abandoned well database. Data from TRRC files.

| County | Field | API # | Current Status | Form 4 | P&A Date | Comments: |
| --- | --- | --- | --- | --- | --- | --- |
| Refugio | | | | | | |
| | Bonnie View | | | | | |
| | | 391-03276 | P&A | Y | 08-24-48 | |
| | | 391-03547 | P&A | Y | 02-10-59 | |
| | | 391-03554 | P&A | Y | 04-03-47 | |
| | | 391-03583 | P&A | Y | 11-25-59 | |
| | | 391-03584 | P&A | Y | 09-14-53 | |
| | | 391-03585 | P&A | Y | 02-20-51 | |
| | | 391-03594 | P&A | Y | 01-09-70 | *Post 66.* |
| | | 391-03606 | P&A | Y | 02-18-45 | |
| | | 391-03608 | P&A | Y | 05-09-39 | |
| | | 391-03631 | P&A | Y | 06-25-51 | |
| | | 391-03633 | P&A | Y | 02-17-47 | |
| | | 391-03665 | P&A | Y | 08-27-56 | |
| | | 391-03692 | P&A | Y | 10-09-62 | |
| | | 391-03695 | P&A | Y | 05-02-55 | |
| | | 391-03696 | P&A | Y | 05-10-51 | |
| | | 391-03697 | P&A | Y | 09-22-56 | |
| | | 391-03698 | P&A | Y | 10-02-49 | |
| | | 391-03712 | P&A? | N | - | App. to Plug indicates no plugs, no mud. |
| | | 391-03875 | P&A | Y | 06-27-65 | |
| | | 391-03880 | P&A | Y | 08-30-78 | *Post 66.* |
| | Greta | | | | | |
| | | 391-00538 | P&A | Y | 08-21-54 | |
| | | 391-00613 | P&A | Y | 09-14-44 | |
| | | 391-00616 | P&A? | N | - | Form 1 only; PI data indicates Casing set. |
| | | 391-00620 | P&A | Y | 03-05-34 | |
| | | 391-00625 | P&A | Y | 05-16-34 | |
| | | 391-00777 | Producer | na | na | |
| | | 391-00787 | P&A | Y | 01-14-64 | |
| | | 391-00788 | P&A? | N | - | No Form 4 or P&A data. Plug date on Form 1 is 4-30-54. |
| | | 391-00789 | P&A | Y | 01-29-34 | |
| | | 391-00810 | P&A | Y | 02-28-34 | |
| | | 391-00811 | P&A? | N | - | Form 1 only; well was drilled. |
| | | 391-00812 | P&A? | N | - | No RRC forms; records lost in 1937. |
| | | 391-00814 | P&A? | N | - | Form 1 only. |
| | | 391-00829 | P&A? | N | - | Forms 1 & 3 only. |
| | | 391-00916 | Injector | na | na | On schedule as disposal well. |
| | | 391-00980 | P&A | Y | 12-13-40 | |
| | | 391-00981 | P&A | Y | 12-13-40 | |
| | | 391-00991 | P&A | Y | 01-21-87 | *Post 66.* |
| | | 391-01004 | P&A | Y | 11-17-59 | |
| | | 391-01016 | P&A? | N | - | Blowout and cratered. No form 4 or P&A data. |
| | | 391-01030 | P&A | Y | 05-03-34 | |
| | | 391-01047 | P&A | Y | 07-28-37 | |
| | | 391-01103 | P&A | Y | 05-13-70 | *Post 66.* |
| | | 391-01192 | Producer | na | na | |
| | | 391-01194 | Shut-in | na | na | Shut-in gas well. |
| | | 391-01197 | P&A? | N | - | Blowout. "Shut-in & Abd." on 6-21-34. No Form 4. |
| | | 391-01220 | Shut-in | na | na | Shut-in gas well. |
| | | 391-03911 | P&A | Y | 12-26-65 | |
| | Lake Pasture | | | | | |
| | | 391-00201 | P&A | Y | 03-09-53 | |
| | | 391-00226 | P&A? | N | - | Producing as of 6-23-67. No Form 4. |
| | | 391-00389 | P&A | Y | 12-07-65 | |
| | | 391-00391 | P&A | Y | 07-29-57 | |
| | | 391-00393 | P&A | Y | 04-20-62 | |
| | | 391-00397 | P&A | Y | 04-30-63 | |
| | | 391-00405 | P&A | Y | 07-17-59 | |
| | | 391-00413 | P&A | Y | 05-20-58 | |

Table 3.10: Data for pre-1967 Refugio County abandoned wells. Wells identified from PI abandoned well database. Data from TRRC files.

| | | | | | | |
|---|---|---|---|---|---|---|
| | La Rosa | | | | | |
| | | 391-03088 | P&A | Y | 04-10-62 | |
| | | 391-03306 | P&A | Y | 03-03-41 | |
| | | 391-03313 | P&A | Y | 08-08-40 | |
| | | 391-03317 | P&A | Y | 07-03-39 | |
| | | 391-03327 | P&A | Y | 05-07-40 | |
| | | 391-03328 | P&A | Y | 06-06-40 | |
| | | 391-03343 | P&A | Y | 03-14-40 | |
| | | 391-03361 | P&A | Y | 01-31-62 | |
| | | 391-03385 | P&A | Y | 06-23-41 | |
| | | 391-03386 | P&A | Y | 02-02-47 | |
| | | 391-03388 | P&A | Y | 03-28-57 | |
| | | 391-03397 | P&A | Y | 09-21-61 | |
| | | 391-03399 | P&A | Y | 11-17-61 | |
| | | 391-03427 | P&A | Y | 05-03-41 | |
| | | 391-03430 | P&A | Y | 11-19-52 | |
| | | 391-03431 | P&A | Y | 12-13-52 | |
| | | 391-03434 | P&A | Y | 06-18-61 | |
| | | 391-03446 | P&A | Y | 04-04-57 | |
| | | 391-03508 | P&A | Y | 06-11-41 | |
| | | 391-03829 | P&A | Y | 02-06-65 | |
| | | 391-03902 | P&A | Y | 10-02-65 | |
| | | | | | | |
| | McFaddin | | | | | |
| | | 391-00065 | P&A | Y | 04-14-42 | |
| | | 391-00067 | P&A | Y | 05-04-61 | |
| | | 391-00153 | P&A | Y | 04-01-42 | |
| | | 391-00172 | P&A | Y | 08-25-41 | |
| | | | | | | |
| | Mary Ellen O'Connor | | | | | |
| | | 391-01817 | P&A | Y | 03-11-55 | |
| | | 391-01863 | P&A | Y | 04-19-56 | |
| | | 391-01890 | P&A | Y | 01-31-73 | *Post 66.* |
| | | 391-01913 | P&A | Y | 02-01-55 | |
| | | 391-01916 | P&A | Y | 01-28-54 | |
| | | 391-01932 | P&A | Y | 03-21-55 | |
| | | 391-01951 | P&A | Y | 04-11-72 | *Post 66.* |
| | | 391-01956 | P&A | Y | 02-15-55 | |
| | | 391-01971 | P&A | Y | 04-19-56 | |
| | | 391-03805 | P&A | Y | 03-05-64 | |
| | | | | | | |
| | Refugio New | | | | | |
| | | 391-02188 | P&A | Y | 04-15-49 | |
| | | 391-02988 | P&A | Y | 03-24-61 | |
| | | 391-02995 | P&A | Y | 04-19-40 | |
| | | | | | | |
| | Refugio Old | | | | | |
| | | 391-01985 | P&A | Y | 01-07-57 | |
| | | 391-01987 | P&A | Y | 04-14-87 | *Post 66.* |
| | | 391-01992 | P&A | Y | 12-25-57 | |
| | | 391-02186 | P&A | Y | 06-18-47 | |
| | | 391-02240 | P&A | Y | 03-16-56 | |
| | | 391-02276 | P&A? | N | - | No Form 4 or P&A data. Only Form 1. |
| | | 391-02293 | P&A? | N | - | No Form 4 or P&A data. Only Form 1. |
| | | 391-02308 | P&A | Y | 06-05-47 | |
| | | 391-02346 | P&A | Y | 08-11-60 | |
| | | 391-02416 | P&A | Y | 05-12-52 | |
| | | 391-02874 | P&A | Y | 10-18-60 | *No intersection. TD:1536'* |
| | | 391-02901 | P&A | Y | 04-23-63 | |
| | | | | | | |
| | Tom O'Connor | | | | | |
| | | 391-00414 | P&A | Y | 11-11-61 | |
| | | 391-00474 | Shut-in | na | na | |
| | | 391-00478 | P&A | Y | 08-28-47 | |
| | | 391-00489 | P&A | Y | 10-24-61 | |

Table 3.10: Continued

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 391-00502 | P&A | Y | 05-30-49 | |
| | | 391-00503 | P&A | Y | 03-02-62 | |
| | | 391-00508 | P&A | Y | 06-04-46 | |
| | | 391-00523 | P&A | Y | 12-23-49 | |
| | | 391-00530 | P&A | Y | 01-15-62 | |
| | | 391-00541 | P&A | Y | 07-16-52 | |
| | | 391-00675 | P&A | N | 03-27-37 | *Blowout; no Form 4; cement pumped.* |
| | | 391-00800 | P&A | Y | 02-02-73 | *Post 66.* |
| | | 391-00849 | P&A | Y | 04-13-50 | |
| | | 391-01318 | P&A | Y | 08-15-38 | |
| | | 391-01350 | P&A? | N | - | No Form 4; Forms 1 & 2. |
| | | 391-01351 | P&A | Y | 11-22-45 | |
| | | 391-01623 | P&A? | N | - | No Form 4. |
| | | 391-01674 | P&A | Y | 11-17-49 | |
| | | 391-01721 | P&A | Y | 02-12-38 | |
| | | 391-01761 | P&A | Y | 11-23-50 | |
| | | 391-01768 | P&A | Y | 02-11-50 | |
| | | 391-01772 | P&A? | N | - | No Form 4; Forms 1 & 2. |
| | | 391-01773 | P&A | Y | 07-21-51 | |
| | | 391-01819 | P&A? | N | - | Application to plug, but no Form 4 or P&A data. |
| | | 391-01820 | P&A? | N | - | Application to plug, but no Form 4 or P&A data. |
| | | 391-02040 | P&A | Y | 07-27-46 | |
| | | 391-03784 | Producer | na | na | Gas well. |
| | | 391-03804 | P&A? | N | - | No Form 4 or P&A data. Only Form 1. |

Table 3.10: Continued

| County | Total Wells | Not Abd. | No Int. | Post '66 P&A | Pre '67 P&A w/ Form 4 | Possible Pre '67 P&A No Form4 |
|---|---|---|---|---|---|---|
| Brazoria | 92 | 1 | 7 | 6 | 65 | 20 |
| Chambers | 34 | 4 | 0 | 6 | 17 | 7 |
| Hardin | 73 | 0 | 7 | 5 | 49 | 19 |
| Jackson | 23 | 0 | 0 | 1 | 19 | 3 |
| Nueces | 48 | 1 | 0 | 5 | 37 | 5 |
| Refugio | 134 | 7 | 1 | 8 | 100 | 19 |
| San Patricio | 29 | 1 | 0 | 1 | 23 | 4 |
| Starr | 39 | 1 | 0 | 2 | 34 | 2 |
| Victoria | 21 | 1 | 1 | 0 | 18 | 2 |
| TOTAL | 493 | 16 | 16 | 34 | 362 | 81 |

Table 3.11: Summary of data for pre-1967 abandoned wells in all Texas Gulf Coast study counties. Wells identified from PI abandoned well database. Data from TRRC files.

| County | Field | Total Wells | Not Abd. | No Int. | Post '66 P&A | Pre '67 P&A w/ Form 4 | Possible Pre '67 P&A No Form4 |
|---|---|---|---|---|---|---|---|
| Brazoria | | | | | | | |
| | Bryan Mound | 3 | 0 | 3 | 0 | 2 | 1 |
| | Damon Mound | 29 | 0 | 3 | 0 | 20 | 9 |
| | Damon Mound E. | 2 | 0 | 0 | 0 | 2 | 0 |
| | Danbury | 11 | 0 | 0 | 1 | 9 | 1 |
| | Hastings E. | 1 | 0 | 0 | 0 | 1 | 0 |
| | Hoskins Mound | 4 | 0 | 1 | 3 | 1 | 0 |
| | Lochridge | 2 | 1 | 0 | 0 | 1 | 0 |
| | Manvel | 10 | 0 | 0 | 0 | 9 | 1 |
| | Nash Dome | 4 | 0 | 0 | 1 | 3 | 0 |
| | Old Ocean | 2 | 0 | 0 | 0 | 2 | 0 |
| | West Columbia | 24 | 0 | 0 | 1 | 15 | 8 |
| | TOTAL | 92 | 1 | 7 | 6 | 65 | 20 |

Table 3.12: Summary of data for pre-1967 Brazoria County abandoned wells. Wells identified from PI abandoned well database. Data from TRRC files.

| County | Field | Total Wells | Not Abd. | No Int. | Post '66 P&A | Pre '67 P&A w/ Form 4 | Possible Pre '67 P&A No Form4 |
|---|---|---|---|---|---|---|---|
| Chambers | | | | | | | |
| | Anhuac | 5 | 0 | 0 | 2 | 3 | 0 |
| | Barbers Hill | 16 | 3 | 0 | 2 | 8 | 3 |
| | Fig Ridge | 2 | 0 | 0 | 0 | 1 | 1 |
| | High Island | 2 | 0 | 0 | 1 | 1 | 0 |
| | Lost Lake | 3 | 0 | 0 | 0 | 2 | 1 |
| | Moss Bluff | 2 | 0 | 0 | 0 | 1 | 1 |
| | Oyster Bayou | 2 | 0 | 0 | 0 | 1 | 1 |
| | Stowell | 2 | 1 | 0 | 1 | 0 | 0 |
| | TOTAL | 34 | 4 | 0 | 6 | 17 | 7 |

Table 3.13: Summary of data for pre-1967 Chambers County abandoned wells. Wells identified from PI abandoned well database. Data from TRRC files.

| County | Field | Total Wells | Not Abd. | No Int. | Post '66 P&A | Pre '67 P&A w/ Form 4 | Possible Pre '67 P&A No Form4 |
|---|---|---|---|---|---|---|---|
| Hardin | | | | | | | |
| | Arriola | 4 | 0 | 0 | 0 | 3 | 1 |
| | Batson New | 9 | 0 | 0 | 0 | 3 | 6 |
| | Batson Old | 13 | 0 | 7 | 1 | 7 | 5 |
| | Saratoga | 16 | 0 | 0 | 1 | 11 | 4 |
| | Saratoga West | 2 | 0 | 0 | 0 | 2 | 0 |
| | Sour Lake | 29 | 0 | 0 | 3 | 23 | 3 |
| | TOTAL | 73 | 0 | 7 | 5 | 49 | 19 |

Table 3.14: Summary of data for pre-1967 Hardin County abandoned wells. Wells identified from PI abandoned well database. Data from TRRC files.

| County | Field | Total Wells | Not Abd. | No Int. | Post '66 P&A | Pre '67 P&A w/ Form 4 | Possible Pre '67 P&A No Form4 |
|---|---|---|---|---|---|---|---|
| Jackson | | | | | | | |
| | Cordele | 3 | 0 | 0 | 0 | 3 | 0 |
| | Ganado | 2 | 0 | 0 | 0 | 2 | 0 |
| | Ganado West | 3 | 0 | 0 | 0 | 3 | 0 |
| | La Ward North | 4 | 0 | 0 | 1 | 3 | 0 |
| | Lolita | 3 | 0 | 0 | 0 | 2 | 1 |
| | Maurbro | 2 | 0 | 0 | 0 | 2 | 0 |
| | Stewart | 2 | 0 | 0 | 0 | 2 | 0 |
| | West Ranch | 4 | 0 | 0 | 0 | 2 | 2 |
| | TOTAL | 23 | 0 | 0 | 1 | 19 | 3 |

Table 3.15: Summary of data for pre-1967 Jackson County abandoned wells. Wells identified from PI abandoned well database. Data from TRRC files.

| County | Field | Total Wells | Not Abd. | No Int. | Post '66 P&A | Pre '67 P&A w/ Form 4 | Possible Pre '67 P&A No Form4 |
|---|---|---|---|---|---|---|---|
| Nueces | | | | | | | |
| | Agua Dulce | 16 | 1 | 0 | 1 | 11 | 3 |
| | Baldwin | 3 | 0 | 0 | 0 | 3 | 0 |
| | Clara Driscoll | 3 | 0 | 0 | 0 | 3 | 0 |
| | London Gin | 3 | 0 | 0 | 0 | 3 | 0 |
| | Richard King | 2 | 0 | 0 | 0 | 2 | 0 |
| | Saxet | 19 | 0 | 0 | 4 | 14 | 1 |
| | White Point E. | 2 | 0 | 0 | 0 | 1 | 1 |
| | TOTAL | 48 | 1 | 0 | 5 | 37 | 5 |

Table 3.16: Summary of data for pre-1967 Nueces County abandoned wells. Wells identified from PI abandoned well database. Data from TRRC files.

| County | Field | Total Wells | Not Abd. | No Int. | Post '66 P&A | Pre '67 P&A w/ Form 4 | Possible Pre '67 P&A No Form4 |
|---|---|---|---|---|---|---|---|
| San Patricio | | | | | | | |
| | Midway | 7 | 0 | 0 | 0 | 7 | 0 |
| | Odem | 2 | 0 | 0 | 0 | 2 | 0 |
| | Plymouth | 5 | 0 | 0 | 0 | 4 | 1 |
| | Plymouth E. | 2 | 0 | 0 | 1 | 1 | 0 |
| | Portilla | 1 | 0 | 0 | 0 | 1 | 0 |
| | Sinton W. | 6 | 0 | 0 | 0 | 4 | 2 |
| | Taft | 3 | 0 | 0 | 0 | 2 | 1 |
| | White Point E. | 3 | 1 | 0 | 0 | 2 | 0 |
| | TOTAL | 29 | 1 | 0 | 1 | 23 | 4 |

Table 3.17: Summary of data for pre-1967 San Patricio County abandoned wells. Wells identified from PI abandoned well database. Data from TRRC files.

| County | Field | Total Wells | Not Abd. | No Int. | Post '66 P&A | Pre '67 P&A w/ Form 4 | Possible Pre '67 P&A No Form4 |
|---|---|---|---|---|---|---|---|
| Starr | | | | | | | |
| | Garcia | 6 | 0 | 0 | 0 | 6 | 0 |
| | Jay Simmons | 2 | 1 | 0 | 0 | 1 | 0 |
| | Kelsey S. | 3 | 0 | 0 | 1 | 2 | 0 |
| | Reyna | 1 | 0 | 0 | 0 | 1 | 0 |
| | Ricaby | 4 | 0 | 0 | 0 | 2 | 2 |
| | Rincon | 12 | 0 | 0 | 0 | 12 | 0 |
| | Sun | 4 | 0 | 0 | 1 | 3 | 0 |
| | Sun N. | 7 | 0 | 0 | 0 | 7 | 0 |
| | TOTAL | 39 | 1 | 0 | 2 | 34 | 2 |

Table 3.18: Summary of data for pre-1967 Starr County abandoned wells. Wells identified from PI abandoned well database. Data from TRRC files.

| County | Field | Total Wells | Not Abd. | No Int. | Post '66 P&A | Pre '67 P&A w/ Form 4 | Possible Pre '67 P&A No Form4 |
|---|---|---|---|---|---|---|---|
| Victoria | | | | | | | |
| | Bloomington | 2 | 0 | 0 | 0 | 2 | 0 |
| | Coletto Creek | 3 | 1 | 0 | 0 | 1 | 1 |
| | Helen Gohlke | 1 | 0 | 0 | 0 | 1 | 0 |
| | Helen Gohlke W. | 1 | 0 | 0 | 0 | 1 | 0 |
| | Heyser | 1 | 0 | 0 | 0 | 1 | 0 |
| | Keeran | 2 | 0 | 0 | 0 | 2 | 0 |
| | McFaddin | 2 | 0 | 1 | 0 | 2 | 0 |
| | Placedo | 4 | 0 | 0 | 0 | 4 | 0 |
| | Placedo E. | 3 | 0 | 0 | 0 | 3 | 0 |
| | Pridham Lake | 2 | 0 | 0 | 0 | 1 | 1 |
| | TOTAL | 21 | 1 | 1 | 0 | 18 | 2 |

Table 3.19: Summary of data for pre-1967 Victoria County abandoned wells. Wells identified from PI abandoned well database. Data from TRRC files.

| County | Field | API # | Current Status | Form 4 | P&A Date | Comments: |
|---|---|---|---|---|---|---|
| Brazoria | | | | | | |
| | Bryan Mound | | | | | |
| | | 039-04538 | P&A? | N | - | *No Forms. PI Data show no intersection.* |
| | | 039-04558 | P&A | Y | 05-01-64 | *No intersection.* |
| | | 039-04555 | P&A | Y | 05-14-40 | *No intersection.* |
| | | | | | | |
| | Damon Mound | | | | | |
| | | 039-02024 | P&A | Y | 11-26-55 | |
| | | 039-02034 | P&A | Y | 04-16-49 | |
| | | 039-02049 | P&A | Y | 04-15-54 | |
| | | 039-02057 | P&A | Y | 01-10-55 | |
| | | 039-02068 | P&A | Y | 06-10-53 | |
| | | 039-02092 | P&A | Y | 04-09-58 | |
| | | 039-02093 | P&A | Y | 04-16-58 | |
| | | 039-02099 | P&A | Y | 09-02-58 | |
| | | 039-02131 | P&A | Y | 10-01-36 | |
| | | 039-02164 | P&A | Y | 06-26-53 | |
| | | 039-02168 | P&A | Y | 08-11-48 | *No intersection. TD:382'* |
| | | 039-02178 | P&A | Y | 07-11-61 | |
| | | 039-02185 | P&A? | N | - | No P&A data; Form 1 only. |
| | | 039-02257 | P&A | Y | 09-27-54 | |
| | | 039-02267 | P&A? | N | - | No P&A data; Form 1 only. |
| | | 039-02269 | P&A | Y | 03-25-57 | |
| | | 039-02289 | P&A | Y | 12-22-49 | |
| | | 039-02290 | P&A | Y | 11-23-49 | |
| | | 039-02333 | P&A? | N | - | No P&A data; Form 1 only. |
| | | 039-02361 | P&A | Y | 07-16-43 | |
| | | 039-02363 | P&A? | N | - | No P&A data; Forms 1 & 2. |
| | | 039-02422 | P&A? | N | - | *No P&A data; no intersection. TD:647'* |
| | | 039-02433 | P&A? | N | - | *No P&A data; no intersection. TD: 447'* |
| | | 039-02466 | P&A? | N | - | No P&A data; Form 1; mud fill(drillers log |
| | | 039-02622 | P&A? | N | - | No Forms; letter req. permit be cancelled. |

Table 3.20: Data for pre-1967 abandoned wells in Brazoria, Chambers, Hardin, Jackson, Nueces, San Patricio, Starr and Victoria Counties. Wells identified from PI abandoned well database. Data from TRRC files.

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 039-02658 | P&A? | Y | 09-28-33 | |
| | | 039-02667 | P&A | Y | 07-27-54 | |
| | | 039-02689 | P&A | Y | 09-26-54 | |
| | | 039-04906 | P&A? | N | - | No P&A data; Form 1 only. |
| | | | | | | |
| | Damon Mound E | | | | | |
| | (A) | 039-02039 | P&A | Y | 04-07-56 | |
| | (B) | 039-02039 | P&A | Y | 10-20-55 | |
| | | | | | | |
| | Danbury | | | | | |
| | | 039-01599 | P&A | Y | 03-16-40 | |
| | | 039-01634 | P&A | Y | 02-14-49 | |
| | | 039-01635 | P&A | Y | 01-21-53 | |
| | | 039-01639 | P&A | Y | 12-31-30 | |
| | | 039-01643 | P&A | Y | 04-29-38 | |
| | | 039-01650 | P&A | Y | 09-05-48 | |
| | | 039-01710 | P&A | Y | 04-08-42 | |
| | | 039-01751 | P&A? | N | - | No P&A data; Form 1 only. |
| | | 039-01790 | P&A | Y | 10-10-34 | |
| | | 039-04251 | P&A | Y | 07-11-54 | |
| | | 039-04260 | P&A | Y | 02-14-90 | *Post 66* |
| | | | | | | |
| | Hastings E | | | | | |
| | | 039-00765 | P&A | Y | 06-06-63 | |
| | | | | | | |
| | Hoskins Mound | | | | | |
| | | 039-04920 | P&A | Y | 07-24-66 | *No intersection. TD: 919'* |
| | | 039-05061 | P&A | Y | 08-05-76 | *Post 66* |
| | | 039-05067 | P&A | Y | 09-26-94 | *Post 66* |
| | | 039-30005 | P&A | Y | 05-21-84 | *Post 66* |
| | | | | | | |
| | Lochridge | | | | | |
| | | 039-01847 | P&A | Y | 07-30-43 | |
| | | 039-01890 | Producer | na | na | |
| | | | | | | |

Table 3.20: Continued

| | | | | | | |
|---|---|---|---|---|---|---|
| | Manvel | | | | | |
| | | 039-00016 | P&A | Y | 07-01-57 | |
| | | 039-00019 | P&A | Y | 05-27-63 | |
| | | 039-00022 | P&A | Y | 04-03-44 | |
| | | 039-00030 | P&A | Y | 09-16-37 | |
| | | 039-00078 | P&A | Y | 05-23-60 | |
| | | 039-00192 | P&A | Y | 05-13-57 | |
| | | 039-01211 | P&A? | N | - | No P&A data; Form 1 only. |
| | | 039-01308 | P&A | Y | 08-01-34 | |
| | | 039-01310 | P&A | Y | 04-13-35 | |
| | | 039-04877 | P&A | Y | 11-20-65 | |
| | | | | | | |
| | Nash Dome | | | | | |
| | | 039-01971 | P&A | Y | 05-09-55 | |
| | | 039-04761 | P&A | Y | 11-22-63 | |
| | | 039-04952 | P&A | Y | 11-11-66 | |
| | | 039-05034 | P&A | Y | 06-15-73 | *Post 66.* |
| | | | | | | |
| | Old Ocean | | | | | |
| | | 039-02811 | P&A | Y | 02-11-39 | |
| | | 039-04024 | P&A | Y | 07-27-45 | |
| | | | | | | |
| | West Columbia | | | | | |
| | | 039-02872 | P&A? | N | - | No P&A data; Form 1 & App. To Plug. |
| | | 039-02885 | P&A? | N | - | No P&A data; Form 1 only. |
| | | 039-02888 | P&A | Y | ??-??-49 | |
| | | 039-03015 | P&A? | N | - | No P&A data; Form 1 only (intent to plug) |
| | | 039-03187 | P&A? | N | - | No Forms. |
| | | 039-03203 | P&A | Y | 12-29-24 | |
| | | 039-03209 | P&A? | N | - | No P&A data; Form 1 only. |
| | | 039-03220 | P&A | Y | 10-01-90 | *Post 66.* |
| | | 039-03266 | P&A | Y | 10-14-23 | |
| | | 039-03267 | P&A | Y | 11-30-20 | |
| | | 039-03273 | P&A | Y | 10-05-19 | |
| | | 039-03285 | P&A | Y | 09-10-20 | |

Table 3.20: Continued

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 039-03434 | P&A | Y | 11-11-52 | |
| | | 039-03476 | P&A | Y | 08-14-53 | |
| | | 039-03493 | P&A | Y | 01-31-57 | |
| | | 039-03516 | P&A? | N | - | Form 1 (shows intent to plug). |
| | | 039-03519 | P&A? | N | - | No Forms. |
| | | 039-03528 | P&A | Y | 10-05-52 | |
| | | 039-03597 | P&A | Y | 06-28-55 | |
| | | 039-03639 | P&A | Y | 06-29-33 | |
| | | 039-03653 | P&A | Y | 04-29-23 | |
| | | 039-03657 | P&A | Y | 04-17-20 | |
| | | 039-03737 | P&A? | N | - | No Forms. |
| | | 039-03743 | P&A | Y | 08-27-56 | |
| | | | | | | |
| Chambers | | | | | | |
| | Anahuac | | | | | |
| | | 071-01243 | P&A | Y | 05-24-38 | |
| | | 071-01449 | P&A | Y | 02-20-38 | |
| | | 071-01597 | P&A | Y | 11-12-47 | |
| | | 071-01625 | P&A | Y | 08-27-87 | *Post 66.* |
| | | 071-01682 | P&A | Y | 11-02-79 | *Post 66.* |
| | | | | | | |
| | Barbers Hill | | | | | |
| | | 071-00020 | P&A | Y | 12-22-81 | *Post 66.* |
| | | 071-00066 | P&A | Y | 06-19-62 | |
| | | 071-00095 | P&A? | N | - | Forms 1 & 2. |
| | | 071-00112 | P&A? | N | - | Form 1 only. |
| | | 071-00225 | P&A | Y | 11-10-63 | |
| | | 071-00245 | P&A | Y | 10-09-84 | *Post 66.* |
| | | 071-00264 | P&A | Y | 09-30-53 | |
| | | 071-00266 | P&A | Y | 05-11-67 | |
| | | 071-00360 | P&A | Y | 05-20-56 | |
| | | 071-00544 | P&A? | N | - | Forms 1, 2 & SW-1. |
| | | 071-00649 | P&A | Y | 05-01-29 | |
| | | 071-00684 | Producer | na | na | |
| | | 071-00706 | Shut-in | na | na | |

Table 3.20: Continued

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 071-00727 | P&A | Y | ??-24-26 | |
| | | 071-00767 | P&A | Y | 08-14-56 | |
| | | 071-00791 | Producer | na | na | |
| | | | | | | |
| | Fig Ridge | | | | | |
| | | 071-01867 | P&A? | N | - | Form 1 & 2A . |
| | | 071-01929 | P&A | Y | 05-27-43 | |
| | | | | | | |
| | High Island | | | | | |
| | | 071-02263 | P&A | Y | 02-22-47 | |
| | | 071-03380 | P&A | Y | 09-14-83 | *Post 66.* |
| | | | | | | |
| | Lost Lake | | | | | |
| | | 071-01060 | P&A | Y | 11-09-61 | |
| | | 071-01078 | P&A | Y | 05-20-47 | |
| | | 071-03423 | P&A? | N | - | |
| | | | | | | |
| | Moss Bluff | | | | | |
| | | 071-01083 | P&A | Y | 11-25-51 | |
| | | 071-01099 | P&A? | N | - | Form 2 only. |
| | | | | | | |
| | Oyster Bayou | | | | | |
| | | 071-02344 | P&A? | N | - | Form 1 only. |
| | | 071-02349 | P&A | Y | 11-24-50 | |
| | | | | | | |
| | Stowell | | | | | |
| | | 071-01824 | Producer | na | na | |
| | | 071-03416 | P&A? | N | - | *No Forms; PI shows Post 66.* |
| | | | | | | |
| Hardin | | | | | | |
| | Arriola | | | | | |
| | | 199-03063 | P&A | Y | 12-17-34 | |
| | | 199-03077 | P&A? | N | - | Form 1 only. |
| | | 199-03079 | P&A | Y | 10-17-32 | |
| | | 199-03093 | P&A | Y | 09-24-59 | |

Table 3.20: Continued

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| | Batson New | | | | | |
| | | 199-00818 | P&A | Y | 10-04-55 | |
| | | 199-00834 | P&A? | N | - | No Forms. |
| | | 199-00844 | P&A? | N | - | Form 1 & SW-1. |
| | | 199-00871 | P&A | Y | 01-18-57 | |
| | | 199-00880 | P&A | Y | 03-27-51 | |
| | | 199-02051 | P&A? | N | - | Form 1 only. |
| | | 199-02077 | P&A? | N | - | Form 1 only. |
| | | 199-02091 | P&A? | N | - | No Forms. |
| | | 199-02092 | P&A? | N | - | Form 1 only. |
| | | | | | | |
| | Batson Old | | | | | |
| | | 199-00832 | P&A | Y | 12-27-57 | |
| | | 199-00998 | P&A? | N | - | Forms 1 & 2. |
| | | 199-01195 | P&A? | N | - | *No intersection; Form 1 only. TD: 456'* |
| | | 199-01278 | P&A | N | - | *No intersection. Forms 1 & 2. TD:1162'* |
| | | 199-01296 | P&A | Y | 12-23-57 | *No intersection. TD: 837'* |
| | | 199-01311 | P&A? | N | - | *No intersection. Forms 1 & 2. TD:1306'* |
| | | 199-01458 | P&A | Y | 11-7-61 | |
| | | 199-02086 | P&A | Y | 09-15-34 | |
| | | 199-02089 | P&A | Y | 06-12-58 | |
| | | 199-03139 | P&A | Y | 10-06-64 | *No intersection. TD: 535'* |
| | | 199-03209 | P&A? | N | - | *No intersection. Form 1 only. TD:920'* |
| | | 199-03308 | P&A | Y | 07-24-65 | |
| | | 199-03412 | P&A | Y | 04-11-77 | *No intersection; Post 66. TD: 366'* |
| | | | | | | |
| | Saratoga | | | | | |
| | | 199-00701 | P&A | Y | 02-18-52 | |
| | | 199-00743 | P&A | Y | 04-11-50 | |
| | | 199-00944 | P&A | Y | 08-22-75 | *Post 66.* |
| | | 199-00967 | P&A | Y | 12-05-51 | |
| | | 199-00973 | P&A | Y | 04-26-56 | |
| | | 199-01530 | P&A | Y | 08-16-59 | |

Table 3.20: Continued

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 199-01587 | P&A | Y | 02-25-58 | |
| | | 199-01631 | P&A? | N | - | Forms 1 & 2. |
| | | 199-01633 | P&A | Y | 04-01-60 | |
| | | 199-01660 | P&A? | N | - | Forms 1 & 2. |
| | | 199-01661 | P&A | Y | 10-06-57 | |
| | | 199-01691 | P&A? | N | - | Form 1 only. |
| | | 199-01695 | P&A | Y | 08-03-59 | |
| | | 199-01779 | P&A? | N | - | Form 1 only. |
| | | 199-01897 | P&A | Y | 02-19-51 | |
| | | 199-02099 | P&A | Y | 10-24-55 | |
| | | | | | | |
| | Saratoga West | | | | | |
| | | 199-01555 | P&A | Y | 08-16-58 | |
| | | 199-01671 | P&A | Y | 02-01-55 | |
| | | | | | | |
| | Sour Lake | | | | | |
| | | 199-02158 | P&A? | N | - | No P&A data. |
| | | 199-02168 | P&A | Y | 11-30-50 | |
| | | 199-02172 | P&A | Y | 10-29-54 | |
| | | 199-02181 | P&A | Y | 02-27-53 | |
| | | 199-02263 | P&A | Y | 04-24-49 | |
| | | 199-02276 | P&A | Y | 12-01-50 | |
| | | 199-02334 | P&A | Y | 07-14-39 | |
| | | 199-02450 | P&A | Y | 09-27-45 | |
| | | 199-02451 | P&A | Y | 02-24-48 | |
| | | 199-02452 | P&A | Y | 12-12-42 | |
| | | 199-02454 | P&A | Y | 04-22-43 | |
| | | 199-02461 | P&A | Y | 07-27-48 | |
| | | 199-02595 | P&A | Y | 08-20-62 | |
| | | 199-02628 | P&A | Y | 01-28-63 | |
| | | 199-02638 | P&A | Y | 03-13-61 | |
| | | 199-02641 | P&A | Y | 05-01-62 | |
| | | 199-02664 | P&A | Y | 08-24-54 | |
| | | 199-02713 | P&A? | N | - | No P&A data. |
| | | 199-02728 | P&A | Y | 10-05-47 | |

Table 3.20: Continued

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 199-02740 | P&A? | N | - | No P&A data. |
| | | 199-02742 | P&A | Y | 08-08-50 | |
| | | 199-02836 | P&A | Y | 07-27-59 | |
| | | 199-02858 | P&A | Y | 12-13-47 | |
| | | 199-02954 | P&A | Y | 02-03-50 | |
| | | 199-02977 | P&A | Y | 05-18-67 | |
| | | 199-03167 | P&A | Y | 07-26-76 | *Post 66.* |
| | | 199-03174 | P&A | Y | 08-19-66 | |
| | | 199-03186 | P&A | Y | 10-24-84 | *Post 66.* |
| | | 199-03187 | P&A | Y | 10-24-84 | *Post 66.* |
| | | | | | | |
| Jackson | | | | | | |
| | Cordele | | | | | |
| | | 239-00157 | P&A | Y | 10-13-58 | |
| | | 239-03879 | P&A | Y | 06-02-39 | |
| | | 239-03881 | P&A | Y | 03-28-45 | |
| | | | | | | |
| | Ganado | | | | | |
| | | 239-00772 | P&A | Y | 06-27-41 | |
| | | 239-01062 | P&A | Y | 03-29-45 | |
| | | | | | | |
| | Ganado West | | | | | |
| | | 239-00525 | P&A | Y | 06-24-42 | |
| | | 239-00532 | P&A | Y | 07-12-46 | |
| | | 239-03464 | P&A | Y | 04-27-65 | |
| | | | | | | |
| | La Ward North | | | | | |
| | | 239-01207 | P&A | Y | 03-27-73 | *Post 66.* |
| | | 239-01250 | P&A | Y | 11-30-44 | |
| | | 239-01378 | P&A | Y | 12-14-44 | |
| | | 239-01629 | P&A | Y | 09-05-43 | |
| | | | | | | |
| | Lolita | | | | | |
| | | 239-02002 | P&A? | N | - | Form 1 only. |
| | | 239-02010 | P&A | Y | 10-04-62 | |

Table 3.20: Continued

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 239-02130 | P&A | Y | 04-11-48 | |
| | | | | | | |
| | Maurbro | | | | | |
| | | 239-01090 | P&A | Y | 10-24-62 | |
| | | 239-01107 | P&A | Y | 01-22-41 | |
| | | | | | | |
| | Stewart | | | | | |
| | | 239-01073 | P&A | Y | 12-20-58 | |
| | | 239-03892 | P&A | Y | 09-11-42 | |
| | | | | | | |
| | West Ranch | | | | | |
| | | 239-02289 | P&A? | N | - | Form 1 & App. to Plug. |
| | | 239-02821 | P&A | Y | 01-08-62 | |
| | | 239-02940 | P&A | Y | 01-23-46 | |
| | | 239-03338 | P&A? | N | - | Forms 1 & 2. |
| | | | | | | |
| Nueces | | | | | | |
| | Agua Dulce | | | | | |
| | | 355-00316 | P&A | Y | 07-05-50 | |
| | | 355-00346 | P&A | Y | 11-21-54 | |
| | | 355-00364 | P&A | Y | 08-02-85 | *Post 66.* |
| | | 355-00429 | P&A | Y | 08-19-54 | |
| | | 355-00433 | P&A | Y | 01-10-59 | |
| | | 355-00448 | P&A | Y | 03-16-58 | |
| | | 355-00553 | P&A | Y | 01-25-45 | |
| | | 355-00724 | P&A | Y | 10-05-51 | |
| | | 355-04672 | P&A? | N | - | Form 1 only. |
| | | 355-04675 | P&A | Y | 04-27-46 | |
| | | 355-04704 | Producer | na | na | |
| | | 355-04714 | P&A | Y | 06-22-39 | |
| | | 355-05017 | P&A? | N | - | Form 1 & 2-A (App. to Plug). |
| | | 355-05252 | P&A? | N | - | Form 1 & 2. |
| | | 355-06212 | P&A | Y | 07-24-66 | |
| | | 355-06233 | P&A | Y | 08-18-66 | |
| | | | | | | |

Table 3.20: Continued

| | | | | | | |
|---|---|---|---|---|---|---|
| | Baldwin | | | | | |
| | | 355-03326 | P&A | Y | 01-20-44 | |
| | | 355-03375 | P&A | Y | 04-11-51 | |
| | | 355-03390 | P&A | Y | 01-01-54 | |
| | | | | | | |
| | Clara Driscoll | | | | | |
| | | 355-04355 | P&A | Y | 09-08-57 | |
| | | 355-04369 | P&A | Y | 08-14-37 | |
| | | 355-04654 | P&A | Y | 08-20-54 | |
| | | | | | | |
| | London Gin | | | | | |
| | | 355-03254 | P&A | Y | 03-10-56 | |
| | | 355-03255 | P&A | Y | 02-02-56 | |
| | | 355-03423 | P&A | Y | 04-23-50 | |
| | | | | | | |
| | Richard King | | | | | |
| | | 355-00094 | P&A | Y | 11-08-56 | |
| | | 355-00188 | P&A | Y | 08-21-33 | |
| | | | | | | |
| | Saxet | | | | | |
| | | 355-01314 | P&A | Y | 04-08-41 | |
| | | 355-01352 | P&A | Y | 02-13-36 | |
| | | 355-01374 | P&A | Y | 03-17-76 | *Post 66.* |
| | | 355-01471 | P&A | Y | 10-08-40 | |
| | | 355-01552 | P&A? | N | - | Forms 1 & 2; well cratered in 1932. |
| | | 355-01590 | P&A | Y | 11-14-70 | *Post 66.* |
| | | 355-01610 | P&A | Y | 09-03-86 | *Post 66.* |
| | | 355-01614 | P&A | Y | 03-19-49 | |
| | | 355-01630 | P&A | Y | 03-18-58 | |
| | | 355-01635 | P&A | Y | 04-11-60 | |
| | | 355-01643 | P&A | Y | 04-24-54 | |
| | | 355-01718 | P&A | Y | 01-23-63 | |
| | | 355-01885 | P&A | Y | 04-13-49 | |
| | | 355-02123 | P&A | Y | 12-07-73 | *Post 66.* |
| | | 355-02344 | P&A | Y | 11-25-31 | |

Table 3.20: Continued

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 355-05767 | P&A | Y | 06-09-64 | |
| | | 355-05804 | P&A | Y | 10-28-64 | |
| | | 355-05986 | P&A | Y | 03-22-65 | |
| | | 355-06099 | P&A | Y | 11-24-65 | |
| | | | | | | |
| | White Point E. | | | | | |
| | | 355-02209 | P&A | Y | 02-09-45 | |
| | | 355-02220 | P&A? | N | - | |
| | | | | | | |
| San Patricio | | | | | | |
| | Midway | | | | | |
| | | 409-02665 | P&A | Y | 01-13-50 | |
| | | 409-02738 | P&A | Y | 04-13-50 | |
| | | 409-02755 | P&A | Y | 10-17-43 | |
| | | 409-02902 | P&A | Y | 12-02-48 | |
| | | 409-02905 | P&A | Y | 07-08-53 | |
| | | 409-02934 | P&A | Y | 01-18-52 | |
| | | 409-04062 | P&A | Y | 09-26-64 | |
| | | | | | | |
| | Odem | | | | | |
| | | 409-03782 | P&A | Y | 06-05-42 | |
| | | 409-03876 | P&A | Y | 04-20-66 | |
| | | | | | | |
| | Plymouth | | | | | |
| | | 409-01251 | P&A | Y | 03-26-37 | |
| | | 409-01474 | P&A | Y | 10-28-36 | |
| | | 409-01517 | P&A | Y | 02-06-63 | |
| | | 409-01526 | P&A? | N | - | Form 3 only. |
| | | 409-01842 | P&A | Y | 01-21-38 | |
| | | | | | | |
| | Plymouth E. | | | | | |
| | | 409-02076 | P&A | Y | 03-21-54 | |
| | | 409-02080 | P&A | Y | 09-15-70 | *Post 66.* |
| | | | | | | |
| | Portilla | | | | | |

Table 3.20: Continued

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 409-01728 | P&A | Y | 07-27-53 | |
| | | | | | | |
| | Sinton W. | | | | | |
| | | 409-00418 | P&A | Y | 12-16-48 | |
| | | 409-00456 | P&A? | N | - | *Forms 1, 2 & SW-1.* |
| | | 409-00557 | P&A | Y | 09-10-50 | |
| | | 409-00642 | P&A | Y | 06-05-62 | |
| | | 409-00710 | P&A | Y | 10-08-50 | |
| | | 409-00842 | P&A? | N | - | *Form 1 only.* |
| | | | | | | |
| | Taft | | | | | |
| | | 409-01305 | P&A? | N | - | Form 1 only. |
| | | 409-01345 | P&A | Y | 12-19-52 | |
| | | 409-01972 | P&A | Y | 12-28-37 | |
| | | | | | | |
| | White Point E. | | | | | |
| | | 409-02813 | P&A | Y | 08-21-50 | |
| | | 409-03189 | Producer | na | na | |
| | | 409-03335 | P&A | Y | 08-25-54 | |
| | | | | | | |
| Starr | | | | | | |
| | Garcia | | | | | |
| | | 427-03906 | P&A | Y | 04-01-48 | |
| | | 427-04083 | P&A | Y | 03-27-52 | |
| | | 427-04094 | P&A | Y | 12-24-50 | |
| | | 427-04229 | P&A | Y | 03-07-46 | |
| | | 427-04233 | P&A | Y | 01-06-54 | |
| | | 427-04250 | P&A | Y | 06-29-44 | |
| | | | | | | |
| | Jay Simmons | | | | | |
| | | 427-00305 | Producer | na | na | |
| | | 427-00374 | P&A | Y | 01-02-58 | |
| | | | | | | |
| | Kelsey S. | | | | | |
| | | 427-00196 | P&A | Y | 09-21-84 | *Post 66.* |

Table 3.20: Continued

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 427-00336 | P&A | Y | 02-02-49 | |
| | | 427-04800 | P&A | Y | 03-07-66 | |
| | | | | | | |
| | Reyna | | | | | |
| | | 427-02365 | P&A | Y | 03-21-56 | |
| | | | | | | |
| | Ricaby | | | | | |
| | | 427-02969 | P&A | Y | 01-16-57 | |
| | | 427-02973 | P&A? | N | - | No Forms. |
| | | 427-03038 | P&A | Y | 05-27-50 | |
| | | 427-03131 | P&A? | N | - | Forms 1 &2. |
| | | | | | | |
| | Rincon | | | | | |
| | | 427-01493 | P&A | Y | 04-25-52 | |
| | | 427-01536 | P&A | Y | 06-03-41 | |
| | | 427-03005 | P&A | Y | 11-21-41 | |
| | | 427-03382 | P&A | Y | 02-21-52 | |
| | | 427-03390 | P&A | Y | 05-22-44 | |
| | | 427-03709 | P&A | Y | 11-05-50 | |
| | | 427-03729 | P&A | Y | 04-10-55 | |
| | | 427-03743 | P&A | Y | 02-24-51 | |
| | | 427-03756 | P&A | Y | 12-30-51 | |
| | | 427-03759 | P&A | Y | 06-19-43 | |
| | | 427-03866 | P&A | Y | 01-10-51 | |
| | | 427-03878 | P&A | Y | 08-26-52 | |
| | | | | | | |
| | Sun | | | | | |
| | | 427-00899 | P&A | Y | 05-19-48 | |
| | | 427-00941 | P&A | Y | 05-13-40 | |
| | | 427-04418 | P&A | Y | 12-27-63 | |
| | | 427-04873 | P&A | Y | 08-10-79 | *Post 66.* |
| | | | | | | |
| | Sun N. | | | | | |
| | | 427-00493 | P&A | Y | 11-03-43 | |
| | | 427-00508 | P&A | Y | 02-27-48 | |

Table 3.20: Continued

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 427-00619 | P&A | Y | 08-02-63 | |
| | | 427-00640 | P&A | Y | 08-29-59 | |
| | | 427-00648 | P&A | Y | 04-22-47 | |
| | | 427-00654 | P&A | Y | 06-22-47 | |
| | | 427-04704 | P&A | Y | 09-26-65 | |
| | | | | | | |
| Victoria | | | | | | |
| | Bloomington | | | | | |
| | | 469-01684 | P&A | Y | 06-30-52 | |
| | | 469-02896 | P&A | Y | 01-08-66 | |
| | | | | | | |
| | Coletto Creek | | | | | |
| | | 469-01124 | P&A? | N | - | *Forms 1 & 2.* |
| | | 469-01223 | Injector | na | na | |
| | | 469-01336 | P&A | Y | 08-05-54 | |
| | | | | | | |
| | Helen Gohlke | | | | | |
| | | 469-00106 | P&A | Y | 04-20-52 | |
| | | | | | | |
| | Helen Gohlke W. | | | | | |
| | | 469-00067 | P&A | Y | 10-27-53 | |
| | | | | | | |
| | Heyser | | | | | |
| | | 469-01986 | P&A | Y | 10-20-38 | |
| | | | | | | |
| | Keeran | | | | | |
| | | 469-00238 | P&A | Y | 02-20-62 | |
| | | 469-02949 | P&A | Y | 03-14-66 | |
| | | | | | | |
| | McFaddin | | | | | |
| | | 469-01570 | P&A | Y | 07-18-32 | *No intersection. TD: 2840'* |
| | | 469-02282 | P&A | Y | 09-04-54 | |
| | | | | | | |
| | Placedo | | | | | |
| | | 469-01868 | P&A | Y | 10-17-53 | |

Table 3.20: Continued

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 469-01879 | P&A | Y | 02-05-42 | |
| | | 469-01972 | P&A | Y | 04-13-63 | |
| | | 469-02583 | P&A | Y | 05-27-56 | |
| | | | | | | |
| | Placedo E. | | | | | |
| | | 469-02710 | P&A | Y | 07-10-53 | |
| | | 469-02749 | P&A | Y | 09-23-59 | |
| | | 469-02812 | P&A | Y | 06-29-55 | |
| | | | | | | |
| | Pridham Lake | | | | | |
| | | 469-00994 | P&A | Y | 01-06-60 | |
| | | 469-01041 | P&A? | N | - | Form 1 only. |

Table 3.20: Continued

| County | Field | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Brazoria | | | | | | | |
| | Bryan Mound | - | 4610 | - | na | na | na |
| | Damon Mound | 1550 | 950 | 1060 | na | na | na |
| | Damon Mound E. | 1150 | 1850 | 1855 | na | na | na |
| | Danbury Dome | 1250 | 1600 | 1600 | na | na | na |
| | Hastings E. | 1700 | 1830 | 1850 | 2620 | 920 | 920/390 = 2.36 |
| | Hoskins Mound | 1000 | 1331 | 1331 | na | na | na |
| | Lochridge | 1300 | 1900 | 1900 | 2120 | 820 | 820/300 = 2.73 |
| | Manvel | 2000 | 1650 | 1950 | 2525 | 525 | 525/250 = 2.10 |
| | Nash Dome | 1150 | 3212 | 4510 | na | na | na |
| | Old Ocean | 1200 | 1675 | 1698 | 2390 | na | na |
| | West Columbia | 1000 | 590 | 590 | na | na | na |
| | | | | | | | Avg = 2.40 |

Table 3.21: Data for Brazoria County study fields. Data from Appendix 1 and Appendix 2. Columns 1-6 include:

Column 1- Deepest base of usable quality groundwater for any UIC database well in the field.

Column 2 - The shallowest permitted top of injection for any UIC database well in the field.

Column 3 - The shallowest permitted top of injection for any active UIC database well in the field.

Column 4 - The base of the shale isolation section from the field log in Appendix 2.

Column 5 - The total thickness of interval from the base of usable quality groundwater to the base of the shale isolation section. This value is not given where the field log of Appendix 2 did not extend to the base of usable quality groundwater.

Column 6 - Column 5 divided by the actual amount (feet) of shale in the total Column 5 interval as shown in the field logs of Appendix 2.

| County | Field | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Chambers | | | | | | | |
| | Anahuac | 1450 | 1000 | 1200 | 2135 | 685 | 685/250 = 2.74 |
| | Barbers Hill | 1800 | 575 | 975 | na | na | na |
| | Fig Ridge | 1250 | 1000 | 1000 | 1935 | 685 | 685/360 = 1.90 |
| | High Island | 100 | 9330 | - | na | na | na |
| | Lost Lake | 500 | 1107 | 1940 | 1995 | na | na |
| | Moss Bluff | 700 | 5565 | 5565 | na | na | na |
| | Oyster Bayou | 1250 | 1400 | 1400 | 3170 | 1920 | 1920/700 = 2.74 |
| | Stowell | 600 | 1177 | 1600 | 1125 | 525 | 525/250 = 2.10 |
| | | | | | | | Avg = 2.37 |

Table 3.22: Data for Chambers County study fields. Data from Appendix 1 and Appendix 2. Columns 1-6 include:
Column 1- Deepest base of usable quality groundwater for any UIC database well in the field.
Column 2 - The shallowest permitted top of injection for any UIC database well in the field.
Column 3 - The shallowest permitted top of injection for any active UIC database well in the field.
Column 4 - The base of the shale isolation section from the field log in Appendix 2.
Column 5 - The total thickness of interval from the base of usable quality groundwater to the base of the shale isolation section. This value is not given where the field log of Appendix 2 did not extend to the base of usable quality groundwater.
Column 6 - Column 5 divided by the actual amount (feet) of shale in the total Column 5 interval as shown in the field logs of Appendix 2.

| County | Field | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Hardin | | | | | | | |
| | Arriola | 1700 | 2610 | 2610 | na | na | na |
| | Batson New | 1550 | 1825 | 2150 | na | na | na |
| | Batson Old | 1900 | 238 | 238 | na | na | na |
| | Saratoga | 2250 | 350 | 834 | na | na | na |
| | Saratoga W. | 2250 | 2373 | 2373 | na | na | na |
| | Sour Lake | 1900 | 400 | 400 | na | na | na |

Table 3.23: Data for Hardin County study fields. Data from Appendix 1 and Appendix 2. Columns 1-6 include:
Column 1- Deepest base of usable quality groundwater for any UIC database well in the field.
Column 2 - The shallowest permitted top of injection for any UIC database well in the field.
Column 3 - The shallowest permitted top of injection for any active UIC database well in the field.
Column 4 - The base of the shale isolation section from the field log in Appendix 2.
Column 5 - The total thickness of interval from the base of usable quality groundwater to the base of the shale isolation section. This value is not given where the field log of Appendix 2 did not extend to the base of usable quality groundwater.
Column 6 - Column 5 divided by the actual amount (feet) of shale in the total Column 5 interval as shown in the field logs of Appendix 2.

| County | Field | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Jackson | | | | | | | |
| | Cordele | 1450 | 1855 | 2130 | 1850 | 400 | 400/250 = 1.60 |
| | Ganado | 1700 | 2170 | 3850 | 2400 | na | na |
| | Ganado W. | 2150 | 1885 | 3975 | 2450 | 300 | 300/250 = 1.20 |
| | La Ward N. | 1575 | 1400 | 1920 | 2235 | 660 | 660/250 = 2.64 |
| | Lolita | 1650 | 1678 | 1767 | 2470 | 820 | 820/250 = 3.28 |
| | Maurbro | 1600 | 2000 | 2100 | 2110 | 510 | 510/295 = 1.73 |
| | Stewart | 1750 | 4100 | 4100 | 2275 | 525 | 525/280 = 1.87 |
| | West Ranch | 1600 | 1885 | 3540 | 2330 | 730 | 730/375 = 1.95 |
| | | | | | | | Avg = 2.04 |

Table 3.24: Data for Jackson County study fields. Data from Appendix 1 and Appendix 2. Columns 1-6 include:
Column 1- Deepest base of usable quality groundwater for any UIC database well in the field.
Column 2 - The shallowest permitted top of injection for any UIC database well in the field.
Column 3 - The shallowest permitted top of injection for any active UIC database well in the field.
Column 4 - The base of the shale isolation section from the field log in Appendix 2.
Column 5 - The total thickness of interval from the base of usable quality groundwater to the base of the shale isolation section. This value is not given where the field log of Appendix 2 did not extend to the base of usable quality groundwater.
Column 6 - Column 5 divided by the actual amount (feet) of shale in the total Column 5 interval as shown in the field logs of Appendix 2.

| County | Field | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Nueces | | | | | | | |
| | Aqua Dulce | 1150 | 1490 | 2670 | 1500 | 435 | 435/250 = 1.82 |
| | Baldwin | 500 | 1550 | 2400 | 1650 | na | na |
| | Clara Driscoll | 1000 | 2200 | 2200 | 1790 | 790 | 790/280 = 2.82 |
| | London Gin | 950 | 1500 | 2016 | 1735 | 785 | 785/250 = 3.14 |
| | Richard King | 1150 | 1600 | 2050 | 2075 | 925 | 925/350 = 2.64 |
| | Saxet | 900 | 1799 | 1799 | 1770 | 870 | 870/440 = 1.98 |
| | White Point E. | 100 | 3040 | 3040 | 1665 | na | na |
| | | | | | | | Avg = 2.48 |

Table 3.25: Data for Nueces County study fields. Data from Appendix 1 and Appendix 2. Columns 1-6 include:
Column 1- Deepest base of usable quality groundwater for any UIC database well in the field.
Column 2 - The shallowest permitted top of injection for any UIC database well in the field.
Column 3 - The shallowest permitted top of injection for any active UIC database well in the field.
Column 4 - The base of the shale isolation section from the field log in Appendix 2.
Column 5 - The total thickness of interval from the base of usable quality groundwater to the base of the shale isolation section. This value is not given where the field log of Appendix 2 did not extend to the base of usable quality groundwater.
Column 6 - Column 5 divided by the actual amount (feet) of shale in the total Column 5 interval as shown in the field logs of Appendix 2.

| County | Field | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| Refugio | | | | | | | |
| | | | | | | | |
| | Bonnie View | 1200 | 3362 | 3650 | 1760 | 560 | 560/270 = 2.07 |
| | | | | | | | |
| | Greta | 1650 | 1600 | 1795 | 2170 | 520 | 520/320 = 1.62 |
| | | | | | | | |
| | Lake Pasture | 1525 | 3074 | 3416 | 1920 | 395 | 395/295 = 1.34 |
| | | | | | | | |
| | La Rosa | 1200 | 2650 | 4500 | 2350 | 1150 | 1150/425 = 2.70 |
| | | | | | | | |
| | McFaddin | 1640 | 1635 | 2000 | 1975 | 325 | 325/250 = 1.30 |
| | | | | | | | |
| | M. E. O'Connor | 1300 | 1800 | 1800 | 1835 | 635 | 535/250 = 2.14 |
| | | | | | | | |
| | New Refugio | 1300 | 2610 | 2610 | 1825 | na | na |
| | | | | | | | |
| | Old Refugio | 1280 | 1750 | 4290 | 1645 | 355 | 365/250 = 1.46 |
| | | | | | | | |
| | Tom O'Connor | 1500 | 1700 | 2950 | 2080 | 580 | 580/250 = 2.32 |
| | | | | | | | |
| | | | | | | | Avg = 2.07 |

Table 3.26: Data for Refugio County study fields. Data from Appendix 1 and Appendix 2. Columns 1-6 include:
Column 1- Deepest base of usable quality groundwater for any UIC database well in the field.
Column 2 - The shallowest permitted top of injection for any UIC database well in the field.
Column 3 - The shallowest permitted top of injection for any active UIC database well in the field.
Column 4 - The base of the shale isolation section from the field log in Appendix 2.
Column 5 - The total thickness of interval from the base of usable quality groundwater to the base of the shale isolation section. This value is not given where the field log of Appendix 2 did not extend to the base of usable quality groundwater.
Column 6 - Column 5 divided by the actual amount (feet) of shale in the total Column 5 interval as shown in the field logs of Appendix 2.

| County | Field | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| San Patricio | | | | | | | |
| | Midway | 1080 | 1540 | 1604 | 1780 | 700 | 700/270 = 2.59 |
| | Odem | 350 | 1300 | 2200 | 2120 | na | na |
| | Plymouth | 1080 | 1500 | 1500 | 1930 | 850 | 850/450 = 1.89 |
| | Plymouth E. | 500 | 1400 | 1400 | 1720 | 1220 | 1220/255 = 4.78 |
| | Portilla | 1170 | 1000 | 1000 | 1935 | 765 | 765/250 = 3.06 |
| | Sinton W. | 1050 | 1110 | 1484 | 1420 | 370 | 370/250 = 1.48 |
| | Taft | 750 | 1360 | 3475 | 2075 | 1325 | 1325/400 = 3.30 |
| | White Point E. | 300 | 1275 | 1275 | 1610 | 1310 | 1310/260 = 5.03 |
| | | | | | | | Avg = 3.16 |

Table 3.27: Data for San Patricio County study fields. Data from Appendix 1 and Appendix 2. Columns 1-6 include:
Column 1- Deepest base of usable quality groundwater for any UIC database well in the field.
Column 2 - The shallowest permitted top of injection for any UIC database well in the field.
Column 3 - The shallowest permitted top of injection for any active UIC database well in the field.
Column 4 - The base of the shale isolation section from the field log in Appendix 2.
Column 5 - The total thickness of interval from the base of usable quality groundwater to the base of the shale isolation section. This value is not given where the field log of Appendix 2 did not extend to the base of usable quality groundwater.
Column 6 - Column 5 divided by the actual amount (feet) of shale in the total Column 5 interval as shown in the field logs of Appendix 2.

| County | Field | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Starr | | | | | | | |
| | Garcia | 250 | 3149 | 3727 | 1005 | 755 | 755/250 = 3.02 |
| | Jay Simmons | 1500 | 5735 | 6050 | 2060 | 560 | 560/295 = 1.90 |
| | Kelsey S. | 1500 | 5240 | 5240 | 2145 | 645 | 645/295 = 2.19 |
| | Reyna | 400 | 649 | - | 720 | 320 | 320/250 = 1.28 |
| | Ricaby | 250 | 1367 | 1367 | 865 | na | na |
| | Rincon | 550 | 1680 | 1680 | 1020 | na | na |
| | Sun | 1200 | 3830 | 3835 | 2310 | na | na |
| | Sun N. | 1200 | 3306 | 4346 | 2090 | 890 | 890/290 = 3.07 |
| | | | | | | | Avg = 2.29 |

Table 3.28: Data for Starr County study fields. Data from Appendix 1 and Appendix 2. Columns 1-6 include:
Column 1- Deepest base of usable quality groundwater for any UIC database well in the field.
Column 2 - The shallowest permitted top of injection for any UIC database well in the field.
Column 3 - The shallowest permitted top of injection for any active UIC database well in the field.
Column 4 - The base of the shale isolation section from the field log in Appendix 2.
Column 5 - The total thickness of interval from the base of usable quality groundwater to the base of the shale isolation section. This value is not given where the field log of Appendix 2 did not extend to the base of usable quality groundwater.
Column 6 - Column 5 divided by the actual amount (feet) of shale in the total Column 5 interval as shown in the field logs of Appendix 2.

| County | Field | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Victoria | | | | | | | |
| | Bloomington | 2050 | 3300 | 3300 | 2580 | 530 | 530/320 = 1.66 |
| | Coletto Creek | 1560 | 1560 | 2413 | 2030 | 480 | 480/250 = 1.92 |
| | Helen Gohlke | 1250 | 1250 | 3350 | 2100 | 850 | 850/250 = 3.40 |
| | Helen Gohlke W. | 1900 | 1920 | 1920 | 2435 | 535 | 535/290 = 1.84 |
| | Heyser | 1700 | 1992 | 4100 | 2060 | 360 | 360/250 = 1.44 |
| | Keeran | 2100 | 3336 | 3400 | 2430 | 330 | 330/250 = 1.32 |
| | McFaddin | 1800 | 3600 | 3600 | 2200 | 400 | 400/250 = 1.60 |
| | Placedo | 2000 | 1954 | 1954 | 2390 | 390 | 390/250 = 1.56 |
| | Placedo E. | 2000? | 2350 | 2350 | 2340 | 340 | 340/250 = 1.36 |
| | Pridham Lake | 1800 | 1728 | 1960 | 2330 | 530 | 530/340 = 1.56 |
| | | | | | | | Avg = 1.77 |

Table 3.29: Data for Victoria County study fields. Data from Appendix 1 and Appendix 2. Columns 1-6 include:
Column 1- Deepest base of usable quality groundwater for any UIC database well in the field.
Column 2 - The shallowest permitted top of injection for any UIC database well in the field.
Column 3 - The shallowest permitted top of injection for any active UIC database well in the field.
Column 4 - The base of the shale isolation section from the field log in Appendix 2.
Column 5 - The total thickness of interval from the base of usable quality groundwater to the base of the shale isolation section. This value is not given where the field log of Appendix 2 did not extend to the base of usable quality groundwater.
Column 6 - Column 5 divided by the actual amount (feet) of shale in the total Column 5 interval as shown in the field logs of Appendix 2.

| County | Field | API # | Current Status | BP | TP | # Plugs | Form 4 | 250' Total Shale | 100' Cont. Shale | P&A Date | Comments: |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Brazoria | | | | | | | | | | | |
| | Bryan Mound | | | | | | | | | | |
| | | 039-04538 | P&A? | - | - | - | N | na | na | - | *No Forms. PI Data show no intersection.* |
| | | 039-04558 | P&A | | | | Y | na | na | 05-01-64 | *No intersection.* |
| | | 039-04555 | P&A | | | | Y | na | na | 05-14-40 | *No intersection.* |
| | | | | | | | | | | | |
| | Damon Mound | | | | | | | | | | |
| | | 039-02024 | P&A | | | | Y | na | na | 11-26-55 | |
| | | 039-02034 | P&A | | | | Y | na | na | 04-16-49 | |
| | | 039-02049 | P&A | | | | Y | na | na | 04-15-54 | |
| | | 039-02057 | P&A | | | | Y | na | na | 01-10-55 | |
| | | 039-02068 | P&A | | | | Y | na | na | 06-10-53 | |
| | | 039-02092 | P&A | | | | Y | na | na | 04-09-58 | |
| | | 039-02093 | P&A | | | | Y | na | na | 04-16-58 | |
| | | 039-02099 | P&A | | | | Y | na | na | 09-02-58 | |
| | | 039-02131 | P&A | | | | Y | na | na | 10-01-36 | |
| | | 039-02164 | P&A | | | | Y | na | na | 06-26-53 | |
| | | 039-02168 | P&A | | | | Y | na | na | 08-11-48 | *No intersection. TD: 382'* |
| | | 039-02178 | P&A | | | | Y | na | na | 07-11-61 | |
| | | 039-02185 | P&A? | - | - | - | N | na | na | - | No P&A data; Form 1 only. |
| | | 039-02257 | P&A | | | | Y | na | na | 09-27-54 | |
| | | 039-02267 | P&A? | - | - | - | N | na | na | - | No P&A data; Form 1 only. |
| | | 039-02269 | P&A | | | | Y | na | na | 03-25-57 | |
| | | 039-02289 | P&A | | | | Y | na | na | 12-22-49 | |
| | | 039-02290 | P&A | | | | Y | na | na | 11-23-49 | |
| | | 039-02333 | P&A? | - | - | - | N | na | na | - | No P&A data; Form 1 only. |
| | | 039-02361 | P&A | | | | Y | na | na | 07-16-43 | |
| | | 039-02363 | P&A? | - | - | - | N | na | na | - | No P&A data; Forms 1 & 2. |
| | | 039-02422 | P&A? | - | - | - | N | na | na | - | *No P&A data; no intersection. TD: 647'* |
| | | 039-02433 | P&A? | - | - | - | N | na | na | - | *No P&A data; no intersection. TD: 447'* |
| | | 039-02466 | P&A? | - | - | - | N | na | na | - | No P&A data; Form 1; mud fill(drillers log). |
| | | 039-02622 | P&A? | - | - | - | N | na | na | - | No Forms; letter req. permit be cancelled. |

Table 3.30: Data for flow-barrier analysis for pre-1967 abandoned wells in all Texas Gulf Coast Study counties. This table combines data from Tables 3.10 and 3.20 and adds the flow-barrier data columns. The 250' Total Shale Column and 100' Continuous Shale Column confirm the availability of those shale intervals as determined from the well logs of Appendix 2. An "na" in those columns applies to shallow to shallow-intermediate depth salt dome fields.

BP = Number of behind pipe flow barriers, including cement and squeezing shale barriers.

TP = Number of through pipe (or through open borehole) flow barriers, including casing, cement plugs and squeezing shale barriers.

# Plugs = Number of TP cement plugs or squeezing shale barriers.

This analysis is only performed for wells without a Form 4.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 039-02658 | P&A? | | | | Y | na | na | 09-28-33 | |
| | | 039-02667 | P&A | | | | Y | na | na | 07-27-54 | |
| | | 039-02689 | P&A | | | | Y | na | na | 09-26-54 | |
| | | 039-04906 | P&A? | - | - | - | N | na | na | - | No P&A data; Form 1 only. |
| | | | | | | | | | | | |
| | Damon Mound E | | | | | | | | | | |
| | (A) | 039-02039 | P&A | | | | Y | na | na | 04-07-56 | |
| | (B) | 039-02039 | P&A | | | | Y | na | na | 10-20-55 | |
| | | | | | | | | | | | |
| | Danbury | | | | | | | | | | |
| | | 039-01599 | P&A | | | | Y | na | na | 03-16-40 | |
| | | 039-01634 | P&A | | | | Y | na | na | 02-14-49 | |
| | | 039-01635 | P&A | | | | Y | na | na | 01-21-53 | |
| | | 039-01639 | P&A | | | | Y | na | na | 12-31-30 | |
| | | 039-01643 | P&A | | | | Y | na | na | 04-29-38 | |
| | | 039-01650 | P&A | | | | Y | na | na | 09-05-48 | |
| | | 039-01710 | P&A | | | | Y | na | na | 04-08-42 | |
| | | 039-01751 | P&A? | - | - | - | N | na | na | - | No P&A data; Form 1 only. |
| | | 039-01790 | P&A | | | | Y | na | na | 10-10-34 | |
| | | 039-04251 | P&A | | | | Y | na | na | 07-11-54 | |
| | | 039-04260 | P&A | | | | Y | na | na | 02-14-90 | *Post 66.* |
| | | | | | | | | | | | |
| | Hastings E | | | | | | | | | | |
| | | 039-00765 | P&A | | | | Y | Y | Y | 06-06-63 | |
| | | | | | | | | | | | |
| | Hoskins Mound | | | | | | | | | | |
| | | 039-04920 | P&A | | | | Y | na | na | 07-24-66 | *No intersection. TD: 919'* |
| | | 039-05061 | P&A | | | | Y | na | na | 08-05-76 | *Post 66.* |
| | | 039-05067 | P&A | | | | Y | na | na | 09-26-94 | *Post 66.* |
| | | 039-30005 | P&A | | | | Y | na | na | 05-21-84 | *Post 66.* |
| | | | | | | | | | | | |
| | Lochridge | | | | | | | | | | |
| | | 039-01847 | P&A | | | | Y | Y | Y | 07-30-43 | |
| | | 039-01890 | Producer | - | - | - | na | Y | Y | na | |
| | | | | | | | | | | | |

Table 3.30: Continued

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Manvel | | | | | | | | | | |
| | | 039-00016 | P&A | | | | Y | Y | Y | 07-01-57 | |
| | | 039-00019 | P&A | | | | Y | Y | Y | 05-27-63 | |
| | | 039-00022 | P&A | | | | Y | Y | Y | 04-03-44 | |
| | | 039-00030 | P&A | | | | Y | Y | Y | 09-16-37 | |
| | | 039-00078 | P&A | | | | Y | Y | Y | 05-23-60 | |
| | | 039-00192 | P&A | | | | Y | Y | Y | 05-13-57 | |
| | | 039-01211 | P&A? | na | 1 | 1 | N | Y | Y | - | No P&A data; Form 1 only. |
| | | 039-01308 | P&A | | | | Y | Y | Y | 08-01-34 | |
| | | 039-01310 | P&A | | | | Y | Y | Y | 04-13-35 | |
| | | 039-04877 | P&A | | | | Y | Y | Y | 11-20-65 | |
| | | | | | | | | | | | |
| | Nash Dome | | | | | | | | | | |
| | | 039-01971 | P&A | | | | Y | na | na | 05-09-55 | |
| | | 039-04761 | P&A | | | | Y | na | na | 11-22-63 | |
| | | 039-04952 | P&A | | | | Y | na | na | 11-11-66 | |
| | | 039-05034 | P&A | | | | Y | na | na | 06-15-73 | *Post 66.* |
| | | | | | | | | | | | |
| | Old Ocean | | | | | | | | | | |
| | | 039-02811 | P&A | | | | Y | Y | Y | 02-11-39 | |
| | | 039-04024 | P&A | | | | Y | Y | Y | 07-27-45 | |
| | | | | | | | | | | | |
| | West Columbia | | | | | | | | | | |
| | | 039-02872 | P&A? | - | - | - | N | na | na | - | No P&A data; Form 1 & App. To Plug. |
| | | 039-02885 | P&A? | - | - | - | N | na | na | - | No P&A data; Form 1 only. |
| | | 039-02888 | P&A | | | | Y | na | na | ??-??-49 | |
| | | 039-03015 | P&A? | - | - | - | N | na | na | - | No P&A data; Form 1 only (intent to plug). |
| | | 039-03187 | P&A? | - | - | - | N | na | na | - | No Forms. |
| | | 039-03203 | P&A | - | - | - | Y | na | na | 12-29-24 | |
| | | 039-03209 | P&A? | - | - | - | N | na | na | - | No P&A data; Form 1 only. |
| | | 039-03220 | P&A | - | - | - | Y | na | na | 10-01-90 | *Post 66.* |
| | | 039-03266 | P&A | | | | Y | na | na | 10-14-23 | |
| | | 039-03267 | P&A | | | | Y | na | na | 11-30-20 | |
| | | 039-03273 | P&A | | | | Y | na | na | 10-05-19 | |
| | | 039-03285 | P&A | | | | Y | na | na | 09-10-20 | |

Table 3.30: Continued

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 039-03434 | P&A | | | | Y | na | na | 11-11-52 | |
| | | 039-03476 | P&A | | | | Y | na | na | 08-14-53 | |
| | | 039-03493 | P&A | | | | Y | na | na | 01-31-57 | |
| | | 039-03516 | P&A? | - | - | - | N | na | na | - | Form 1 (shows intent to plug). |
| | | 039-03519 | P&A? | - | - | - | N | na | na | - | No Forms. |
| | | 039-03528 | P&A | | | | Y | na | na | 10-05-52 | |
| | | 039-03597 | P&A | | | | Y | na | na | 06-28-55 | |
| | | 039-03639 | P&A | | | | Y | na | na | 06-29-33 | |
| | | 039-03653 | P&A | | | | Y | na | na | 04-29-23 | |
| | | 039-03657 | P&A | | | | Y | na | na | 04-17-20 | |
| | | 039-03737 | P&A? | - | - | - | N | na | na | - | No Forms. |
| | | 039-03743 | P&A | | | | Y | na | na | 08-27-56 | |
| | | | | | | | | | | | |
| Chambers | | | | | | | | | | | |
| | Anahuac | | | | | | | | | | |
| | | 071-01243 | P&A | | | | Y | Y | Y | 05-24-38 | |
| | | 071-01449 | P&A | | | | Y | Y | Y | 02-20-38 | |
| | | 071-01597 | P&A | | | | Y | Y | Y | 11-12-47 | |
| | | 071-01625 | P&A | | | | Y | Y | Y | 08-27-87 | *Post 66.* |
| | | 071-01682 | P&A | | | | Y | Y | Y | 11-02-79 | *Post 66.* |
| | | | | | | | | | | | |
| | Barbers Hill | | | | | | | | | | |
| | | 071-00020 | P&A | | | | Y | na | na | 12-22-81 | *Post 66.* |
| | | 071-00066 | P&A | | | | Y | na | na | 06-19-62 | |
| | | 071-00095 | P&A? | - | - | - | N | na | na | - | Forms 1 & 2. |
| | | 071-00112 | P&A? | - | - | - | N | na | na | - | Form 1 only. |
| | | 071-00225 | P&A | | | | Y | na | na | 11-10-63 | |
| | | 071-00245 | P&A | | | | Y | na | na | 10-09-84 | *Post 66.* |
| | | 071-00264 | P&A | - | - | - | Y | na | na | 09-30-53 | |
| | | 071-00266 | P&A | | | | Y | na | na | 05-11-67 | |
| | | 071-00360 | P&A | | | | Y | na | na | 05-20-56 | |
| | | 071-00544 | P&A? | - | - | - | N | na | na | - | Forms 1, 2 & SW-1. |
| | | 071-00649 | P&A | | | | Y | na | na | 05-01-29 | |
| | | 071-00684 | Producer | - | - | - | na | na | na | na | |
| | | 071-00706 | Shut-in | - | - | - | na | na | na | na | Forms 1, 2, SW-1 & P-4. |

Table 3.30: Continued

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 071-00727 | P&A | | | | Y | na | na | ??-24-26 | |
| | | 071-00767 | P&A | | | | Y | na | na | 08-14-56 | |
| | | 071-00791 | Producer | - | - | - | na | na | na | na | |
| | | | | | | | | | | | |
| | Fig Ridge | | | | | | | | | | |
| | | 071-01867 | P&A? | 1 | 3 | 1 | N | Y | Y | - | Form 1 & 2A . |
| | | 071-01929 | P&A | | | | Y | Y | Y | 05-27-43 | |
| | | | | | | | | | | | |
| | High Island | | | | | | | | | | |
| | | 071-02263 | P&A | | | | Y | na | na | 02-22-47 | |
| | | 071-03380 | P&A | | | | Y | na | na | 09-14-83 | *Post 66.* |
| | | | | | | | | | | | |
| | Lost Lake | | | | | | | | | | |
| | | 071-01060 | P&A | | | | Y | Y | Y | 11-09-61 | |
| | | 071-01078 | P&A | | | | Y | Y | Y | 05-20-47 | |
| | | 071-03423 | P&A? | 1 | na | na | N | Y | Y | - | |
| | | | | | | | | | | | |
| | Moss Bluff | | | | | | | | | | |
| | | 071-01083 | P&A | | | | Y | na | na | 11-25-51 | |
| | | 071-01099 | P&A? | - | - | - | N | na | na | - | Form 2 only. |
| | | | | | | | | | | | |
| | Oyster Bayou | | | | | | | | | | |
| | | 071-02344 | P&A? | na | 1 | 1 | N | Y | Y | - | Form 1 only. |
| | | 071-02349 | P&A | | | | Y | Y | Y | 11-24-50 | |
| | | | | | | | | | | | |
| | Stowell | | | | | | | | | | |
| | | 071-01824 | Producer | - | - | - | na | Y | Y | na | |
| | | 071-03416 | P&A? | na | 1 | 1 | N | Y | Y | - | *No Forms; PI-shows Post 66.* |
| | | | | | | | | | | | |
| Hardin | | | | | | | | | | | |
| | Arriola | | | | | | | | | | |
| | | 199-03063 | P&A | | | | Y | na | na | 12-17-34 | |
| | | 199-03077 | P&A? | - | - | - | N | na | na | - | Form 1 only. |
| | | 199-03079 | P&A | | | | Y | na | na | 10-17-32 | |
| | | 199-03093 | P&A | | | | Y | na | na | 09-24-59 | |

Table 3.30: Continued

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| | Batson New | | | | | | | | | | |
| | | 199-00818 | P&A | | | | Y | na | na | 10-04-55 | |
| | | 199-00834 | P&A? | - | - | - | N | na | na | - | No Forms. |
| | | 199-00844 | P&A? | - | - | - | N | na | na | - | Form 1 & SW-1. |
| | | 199-00871 | P&A | | | | Y | na | na | 01-18-57 | |
| | | 199-00880 | P&A | | | | Y | na | na | 03-27-51 | |
| | | 199-02051 | P&A? | - | - | - | N | na | na | - | Form 1 only. |
| | | 199-02077 | P&A? | - | - | - | N | na | na | - | Form 1 only. |
| | | 199-02091 | P&A? | - | - | - | N | na | na | - | No Forms. |
| | | 199-02092 | P&A? | - | - | - | N | na | na | - | Form 1 only. |
| | | | | | | | | | | | |
| | Batson Old | | | | | | | | | | |
| | | 199-00832 | P&A | | | | Y | na | na | 12-27-57 | |
| | | 199-00998 | P&A? | - | - | - | N | na | na | - | Forms 1 & 2. |
| | | 199-01195 | P&A? | - | - | - | N | na | na | - | *No intersection; Form 1 only. TD: 456'* |
| | | 199-01278 | P&A | - | - | - | N | na | na | - | *No intersection. Forms 1 & 2. TD:1162'* |
| | | 199-01296 | P&A | | | | Y | na | na | 12-23-57 | *No intersection. TD: 837'* |
| | | 199-01311 | P&A? | - | - | - | N | na | na | - | *No intersection. Forms 1 & 2. TD:1306'* |
| | | 199-01458 | P&A | | | | Y | na | na | 11-7-61 | |
| | | 199-02086 | P&A | | | | Y | na | na | 09-15-34 | |
| | | 199-02089 | P&A | | | | Y | na | na | 06-12-58 | |
| | | 199-03139 | P&A | | | | Y | na | na | 10-06-64 | *No intersection. TD: 535'* |
| | | 199-03209 | P&A? | - | - | - | N | na | na | - | *No intersection. Form 1 only. TD:920'* |
| | | 199-03308 | P&A | | | | Y | na | na | 07-24-65 | |
| | | 199-03412 | P&A | | | | Y | na | na | 04-11-77 | *No intersection; Post 66. TD: 366'* |
| | | | | | | | | | | | |
| | Saratoga | | | | | | | | | | |
| | | 199-00701 | P&A | | | | Y | na | na | 02-18-52 | |
| | | 199-00743 | P&A | | | | Y | na | na | 04-11-50 | |
| | | 199-00944 | P&A | | | | Y | na | na | 08-22-75 | *Post 66.* |
| | | 199-00967 | P&A | | | | Y | na | na | 12-05-51 | |
| | | 199-00973 | P&A | | | | Y | na | na | 04-26-56 | |
| | | 199-01530 | P&A | | | | Y | na | na | 08-16-59 | |

Table 3.30: Continued

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 199-01587 | P&A | | | | Y | na | na | 02-25-58 | |
| | | 199-01631 | P&A? | - | - | - | N | na | na | - | Forms 1 & 2. |
| | | 199-01633 | P&A | | | | Y | na | na | 04-01-60 | |
| | | 199-01660 | P&A? | - | - | - | N | na | na | - | Forms 1 & 2. |
| | | 199-01661 | P&A | | | | Y | na | na | 10-06-57 | |
| | | 199-01691 | P&A? | - | - | - | N | na | na | - | Form 1 only. |
| | | 199-01695 | P&A | | | | Y | na | na | 08-03-59 | |
| | | 199-01779 | P&A? | - | - | - | N | na | na | - | Form 1 only. |
| | | 199-01897 | P&A | | | | Y | na | na | 02-19-51 | |
| | | 199-02099 | P&A | | | | Y | na | na | 10-24-55 | |
| | | | | | | | | | | | |
| | Saratoga West | | | | | | | | | | |
| | | 199-01555 | P&A | | | | Y | na | na | 08-16-58 | |
| | | 199-01671 | P&A | | | | Y | na | na | 02-01-55 | |
| | | | | | | | | | | | |
| | Sour Lake | | | | | | | | | | |
| | | 199-02158 | P&A? | - | - | - | N | na | na | - | No P&A data. |
| | | 199-02168 | P&A | | | | Y | na | na | 11-30-50 | |
| | | 199-02172 | P&A | | | | Y | na | na | 10-29-54 | |
| | | 199-02181 | P&A | | | | Y | na | na | 02-27-53 | |
| | | 199-02263 | P&A | | | | Y | na | na | 04-24-49 | |
| | | 199-02276 | P&A | | | | Y | na | na | 12-01-50 | |
| | | 199-02334 | P&A | | | | Y | na | na | 07-14-39 | |
| | | 199-02450 | P&A | | | | Y | na | na | 09-27-45 | |
| | | 199-02451 | P&A | | | | Y | na | na | 02-24-48 | |
| | | 199-02452 | P&A | | | | Y | na | na | 12-12-42 | |
| | | 199-02454 | P&A | | | | Y | na | na | 04-22-43 | |
| | | 199-02461 | P&A | | | | Y | na | na | 07-27-48 | |
| | | 199-02595 | P&A | | | | Y | na | na | 08-20-62 | |
| | | 199-02628 | P&A | | | | Y | na | na | 01-28-63 | |
| | | 199-02638 | P&A | | | | Y | na | na | 03-13-61 | |
| | | 199-02641 | P&A | | | | Y | na | na | 05-01-62 | |
| | | 199-02664 | P&A | | | | Y | na | na | 08-24-54 | |
| | | 199-02713 | P&A? | - | - | - | N | na | na | - | No P&A data. |
| | | 199-02728 | P&A | | | | Y | na | na | 10-05-47 | |

Table 3.30: Continued

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 199-02740 | P&A? | - | - | - | N | na | na | - | No P&A data. |
| | | 199-02742 | P&A | | | | Y | na | na | 08-08-50 | |
| | | 199-02836 | P&A | | | | Y | na | na | 07-27-59 | |
| | | 199-02858 | P&A | | | | Y | na | na | 12-13-47 | |
| | | 199-02954 | P&A | | | | Y | na | na | 02-03-50 | |
| | | 199-02977 | P&A | | | | Y | na | na | 05-18-67 | |
| | | 199-03167 | P&A | | | | Y | na | na | 07-26-76 | *Post 66.* |
| | | 199-03174 | P&A | | | | Y | na | na | 08-19-66 | |
| | | 199-03186 | P&A | | | | Y | na | na | 10-24-84 | *Post 66.* |
| | | 199-03187 | P&A | | | | Y | na | na | 10-24-84 | *Post 66.* |
| | | | | | | | | | | | |
| Jackson | | | | | | | | | | | |
| | Cordele | | | | | | | | | | |
| | | 239-00157 | P&A | | | | Y | Y | Y | 10-13-58 | |
| | | 239-03879 | P&A | | | | Y | Y | Y | 06-02-39 | |
| | | 239-03881 | P&A | | | | Y | Y | Y | 03-28-45 | |
| | | | | | | | | | | | |
| | Ganado | | | | | | | | | | |
| | | 239-00772 | P&A | | | | Y | Y | Y | 06-27-41 | |
| | | 239-01062 | P&A | | | | Y | Y | Y | 03-29-45 | |
| | | | | | | | | | | | |
| | Ganado West | | | | | | | | | | |
| | | 239-00525 | P&A | | | | Y | Y | Y | 06-24-42 | |
| | | 239-00532 | P&A | | | | Y | Y | Y | 07-12-46 | |
| | | 239-03464 | P&A | | | | Y | Y | Y | 04-27-65 | |
| | | | | | | | | | | | |
| | La Ward North | | | | | | | | | | |
| | | 239-01207 | P&A | | | | Y | Y | Y | 03-27-73 | *Post 66.* |
| | | 239-01250 | P&A | | | | Y | Y | Y | 11-30-44 | |
| | | 239-01378 | P&A | | | | Y | Y | Y | 12-14-44 | |
| | | 239-01629 | P&A | | | | Y | Y | Y | 09-05-43 | |
| | | | | | | | | | | | |
| | Lolita | | | | | | | | | | |
| | | 239-02002 | P&A? | na | 1 | 1 | N | Y | Y | - | Form 1 only. |
| | | 239-02010 | P&A | | | | Y | Y | Y | 10-04-62 | |

Table 3.30: Continued

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 239-02130 | P&A | | | | Y | Y | Y | 04-11-48 | |
| | | | | | | | | | | | |
| | Maurbro | | | | | | | | | | |
| | | 239-01090 | P&A | | | | Y | Y | Y | 10-24-62 | |
| | | 239-01107 | P&A | | | | Y | Y | Y | 01-22-41 | |
| | | | | | | | | | | | |
| | Stewart | | | | | | | | | | |
| | | 239-01073 | P&A | | | | Y | Y | Y | 12-20-58 | |
| | | 239-03892 | P&A | | | | Y | Y | Y | 09-11-42 | |
| | | | | | | | | | | | |
| | West Ranch | | | | | | | | | | |
| | | 239-02289 | P&A? | 1 | na | na | N | Y | Y | - | Form 1 & App. to Plug. |
| | | 239-02821 | P&A | | | | Y | Y | Y | 01-08-62 | |
| | | 239-02940 | P&A | | | | Y | Y | Y | 01-23-46 | |
| | | 239-03338 | P&A? | na | 1 | 1 | N | Y | Y | - | Forms 1 & 2. |
| | | | | | | | | | | | |
| Nueces | | | | | | | | | | | |
| | Agua Dulce | | | | | | | | | | |
| | | 355-00316 | P&A | | | | Y | Y | Y | 07-05-50 | |
| | | 355-00346 | P&A | | | | Y | Y | Y | 11-21-54 | |
| | | 355-00364 | P&A | | | | Y | Y | Y | 08-02-85 | *Post 66.* |
| | | 355-00429 | P&A | | | | Y | Y | Y | 08-19-54 | |
| | | 355-00433 | P&A | | | | Y | Y | Y | 01-10-59 | |
| | | 355-00448 | P&A | | | | Y | Y | Y | 03-16-58 | |
| | | 355-00553 | P&A | | | | Y | Y | Y | 01-25-45 | |
| | | 355-00724 | P&A | | | | Y | Y | Y | 10-05-51 | |
| | | 355-04672 | P&A? | na | 1 | 1 | N | Y | Y | - | Form 1 only. |
| | | 355-04675 | P&A | | | | Y | Y | Y | 04-27-46 | |
| | | 355-04704 | Producer | - | - | - | na | Y | Y | na | |
| | | 355-04714 | P&A | | | | Y | Y | Y | 06-22-39 | |
| | | 355-05017 | P&A? | na | 1 | 1 | N | Y | Y | - | Form 1 & 2-A (App. to Plug). |
| | | 355-05252 | P&A? | 1 | na | na | N | Y | Y | - | Form 1 & 2. |
| | | 355-06212 | P&A | | | | Y | Y | Y | 07-24-66 | |
| | | 355-06233 | P&A | | | | Y | Y | Y | 08-18-66 | |
| | | | | | | | | | | | |

Table 3.30: Continued

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Baldwin | | | | | | | | | | |
| | | 355-03326 | P&A | | | | Y | Y | Y | 01-20-44 | |
| | | 355-03375 | P&A | | | | Y | Y | Y | 04-11-51 | |
| | | 355-03390 | P&A | | | | Y | Y | Y | 01-01-54 | |
| | | | | | | | | | | | |
| | Clara Driscoll | | | | | | | | | | |
| | | 355-04355 | P&A | | | | Y | Y | Y | 09-08-57 | |
| | | 355-04369 | P&A | | | | Y | Y | Y | 08-14-37 | |
| | | 355-04654 | P&A | | | | Y | Y | Y | 08-20-54 | |
| | | | | | | | | | | | |
| | London Gin | | | | | | | | | | |
| | | 355-03254 | P&A | | | | Y | Y | Y | 03-10-56 | |
| | | 355-03255 | P&A | | | | Y | Y | Y | 02-02-56 | |
| | | 355-03423 | P&A | | | | Y | Y | Y | 04-23-50 | |
| | | | | | | | | | | | |
| | Richard King | | | | | | | | | | |
| | | 355-00094 | P&A | | | | Y | Y | Y | 11-08-56 | |
| | | 355-00188 | P&A | | | | Y | Y | Y | 08-21-33 | |
| | | | | | | | | | | | |
| | Saxet | | | | | | | | | | |
| | | 355-01314 | P&A | | | | Y | Y | Y | 04-08-41 | |
| | | 355-01352 | P&A | | | | Y | Y | Y | 02-13-36 | |
| | | 355-01374 | P&A | | | | Y | Y | Y | 03-17-76 | *Post 66.* |
| | | 355-01471 | P&A | | | | Y | Y | Y | 10-08-40 | |
| | | 355-01552 | P&A? | 1 | na | na | N | Y | Y | - | Forms 1 & 2; well cratered in 1932. |
| | | 355-01590 | P&A | | | | Y | Y | Y | 11-14-70 | *Post 66.* |
| | | 355-01610 | P&A | | | | Y | Y | Y | 09-03-86 | *Post 66.* |
| | | 355-01614 | P&A | | | | Y | Y | Y | 03-19-49 | |
| | | 355-01630 | P&A | | | | Y | Y | Y | 03-18-58 | |
| | | 355-01635 | P&A | | | | Y | Y | Y | 04-11-60 | |
| | | 355-01643 | P&A | | | | Y | Y | Y | 04-24-54 | |
| | | 355-01718 | P&A | | | | Y | Y | Y | 01-23-63 | |
| | | 355-01885 | P&A | | | | Y | Y | Y | 04-13-49 | |
| | | 355-02123 | P&A | | | | Y | Y | Y | 12-07-73 | *Post 66.* |
| | | 355-02344 | P&A | | | | Y | Y | Y | 11-25-31 | |

Table 3.30: Continued

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 355-05767 | P&A | | | | Y | Y | Y | 06-09-64 | |
| | | 355-05804 | P&A | | | | Y | Y | Y | 10-28-64 | |
| | | 355-05986 | P&A | | | | Y | Y | Y | 03-22-65 | |
| | | 355-06099 | P&A | | | | Y | Y | Y | 11-24-65 | |
| | | | | | | | | | | | |
| | White Point E. | | | | | | | | | | |
| | | 355-02209 | P&A | | | | Y | Y | Y | 02-09-45 | |
| | | 355-02220 | P&A? | 1 | 3 | 1 | N | Y | Y | - | |
| | | | | | | | | | | | |
| Refugio | | | | | | | | | | | |
| | Bonnie View | | | | | | | | | | |
| | | 391-03276 | P&A | | | | Y | Y | Y | 08-24-48 | |
| | | 391-03547 | P&A | | | | Y | Y | Y | 02-10-59 | |
| | | 391-03554 | P&A | | | | Y | Y | Y | 04-03-47 | |
| | | 391-03583 | P&A | | | | Y | Y | Y | 11-25-59 | |
| | | 391-03584 | P&A | | | | Y | Y | Y | 09-14-53 | |
| | | 391-03585 | P&A | | | | Y | Y | Y | 02-20-51 | |
| | | 391-03594 | P&A | | | | Y | Y | Y | 01-09-70 | *Post 66.* |
| | | 391-03606 | P&A | | | | Y | Y | Y | 02-18-45 | |
| | | 391-03608 | P&A | | | | Y | Y | Y | 05-09-39 | |
| | | 391-03631 | P&A | | | | Y | Y | Y | 06-25-51 | |
| | | 391-03633 | P&A | | | | Y | Y | Y | 02-17-47 | |
| | | 391-03665 | P&A | | | | Y | Y | Y | 08-27-56 | |
| | | 391-03692 | P&A | | | | Y | Y | Y | 10-09-62 | |
| | | 391-03695 | P&A | | | | Y | Y | Y | 05-02-55 | |
| | | 391-03696 | P&A | | | | Y | Y | Y | 05-10-51 | |
| | | 391-03697 | P&A | | | | Y | Y | Y | 09-22-56 | |
| | | 391-03698 | P&A | | | | Y | Y | Y | 10-02-49 | |
| | | 391-03712 | P&A? | 1 | 3 | 1 | N | Y | Y | - | App. to Plug indicates no plugs, no mud. |
| | | 391-03875 | P&A | | | | Y | Y | Y | 06-27-65 | |
| | | 391-03880 | P&A | | | | Y | Y | Y | 08-30-78 | *Post 66.* |
| | | | | | | | | | | | |
| | Greta | | | | | | | | | | |
| | | 391-00538 | P&A | | | | Y | Y | Y | 08-21-54 | |
| | | 391-00613 | P&A | | | | Y | Y | Y | 09-14-44 | |

Table 3.30: Continued

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 391-00616 | P&A? | 1 | 1 | 0 | N | Y | Y | - | Form 1 only; PI data indicates Casing set. |
| | | 391-00620 | P&A | | | | Y | Y | Y | 03-05-34 | |
| | | 391-00625 | P&A | | | | Y | Y | Y | 05-16-34 | |
| | | 391-00777 | Producer | | | | na | Y | Y | na | |
| | | 391-00787 | P&A | | | | Y | Y | Y | 01-14-64 | |
| | | 391-00788 | P&A? | 1 | 1 | 0 | N | Y | Y | - | No Form 4 ; Plug date(Form 1) 4-30-54. |
| | | 391-00789 | P&A | | | | Y | Y | Y | 01-29-34 | |
| | | 391-00810 | P&A | | | | Y | Y | Y | 02-28-34 | |
| | | 391-00811 | P&A? | na | 1 | 1 | N | Y | Y | - | Form 1 only; well was drilled. |
| | | 391-00812 | P&A? | na | 1 | 1 | N | Y | Y | - | No RRC forms; records lost in 1937. |
| | | 391-00814 | P&A? | na | 1 | 1 | N | Y | Y | - | Form 1 only. |
| | | 391-00829 | P&A? | 1 | 1 | 0 | N | Y | Y | - | Forms 1 & 3 only. |
| | | 391-00916 | Injector | | | | na | Y | Y | na | On schedule as disposal well. |
| | | 391-00980 | P&A | | | | Y | Y | Y | 12-13-40 | |
| | | 391-00981 | P&A | | | | Y | Y | Y | 12-13-40 | |
| | | 391-00991 | P&A | | | | Y | Y | Y | 01-21-87 | *Post 66.* |
| | | 391-01004 | P&A | | | | Y | Y | Y | 11-17-59 | |
| | | 391-01016 | P&A? | na | 1 | 1 | N | Y | Y | - | Blowout and cratered. No form 4 or P&A dat |
| | | 391-01030 | P&A | | | | Y | Y | Y | 05-03-34 | |
| | | 391-01047 | P&A | | | | Y | Y | Y | 07-28-37 | |
| | | 391-01103 | P&A | | | | Y | Y | Y | 05-13-70 | *Post 66.* |
| | | 391-01192 | Producer | | | | na | Y | Y | na | |
| | | 391-01194 | Shut-in | | | | na | Y | Y | na | Shut-in gas well. |
| | | 391-01197 | P&A? | na | 1 | 1 | N | Y | Y | - | Blowout. Shut-in & Abd. 6-21-34. No Form 4 |
| | | 391-01220 | Shut-in | | | | na | Y | Y | na | Shut-in gas well. |
| | | 391-03911 | P&A | | | | Y | Y | Y | 12-26-65 | |
| | | | | | | | | | | | |
| | Lake Pasture | | | | | | | | | | |
| | | 391-00201 | P&A | | | | Y | Y | Y | 03-09-53 | |
| | | 391-00226 | P&A? | 2 | na | na | N | Y | Y | - | Producing as of 6-23-67. No Form 4. |
| | | 391-00389 | P&A | | | | Y | Y | Y | 01-10-57 | |
| | | 391-00391 | P&A | | | | Y | Y | Y | 07-29-57 | |
| | | 391-00393 | P&A | | | | Y | Y | Y | 04-20-62 | |
| | | 391-00397 | P&A | | | | Y | Y | Y | 04-30-63 | |
| | | 391-00405 | P&A | | | | Y | Y | Y | 07-17-59 | |

Table 3.30: Continued

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 391-00413 | P&A | | | | Y | Y | Y | 05-20-58 | |
| | | | | | | | | | | | |
| | La Rosa | | | | | | | | | | |
| | | 391-03088 | P&A | | | | Y | Y | Y | 04-10-62 | |
| | | 391-03306 | P&A | | | | Y | Y | Y | 03-03-41 | |
| | | 391-03313 | P&A | | | | Y | Y | Y | 08-08-40 | |
| | | 391-03317 | P&A | | | | Y | Y | Y | 07-03-39 | |
| | | 391-03327 | P&A | | | | Y | Y | Y | 05-07-40 | |
| | | 391-03328 | P&A | | | | Y | Y | Y | 06-06-40 | |
| | | 391-03343 | P&A | | | | Y | Y | Y | 03-14-40 | |
| | | 391-03361 | P&A | | | | Y | Y | Y | 01-31-62 | |
| | | 391-03385 | P&A | | | | Y | Y | Y | 06-23-41 | |
| | | 391-03386 | P&A | | | | Y | Y | Y | 02-02-47 | |
| | | 391-03388 | P&A | | | | Y | Y | Y | 03-28-57 | |
| | | 391-03397 | P&A | | | | Y | Y | Y | 09-21-61 | |
| | | 391-03399 | P&A | | | | Y | Y | Y | 11-17-61 | |
| | | 391-03427 | P&A | | | | Y | Y | Y | 05-03-41 | |
| | | 391-03430 | P&A | | | | Y | Y | Y | 11-19-52 | |
| | | 391-03431 | P&A | | | | Y | Y | Y | 12-13-52 | |
| | | 391-03434 | P&A | | | | Y | Y | Y | 06-18-61 | |
| | | 391-03446 | P&A | | | | Y | Y | Y | 04-04-57 | |
| | | 391-03508 | P&A | | | | Y | Y | Y | 06-11-41 | |
| | | 391-03829 | P&A | | | | Y | Y | Y | 02-06-65 | |
| | | 391-03902 | P&A | | | | Y | Y | Y | 10-02-65 | |
| | | | | | | | | | | | |
| | McFaddin | | | | | | | | | | |
| | | 391-00065 | P&A | | | | Y | Y | Y | 04-14-42 | |
| | | 391-00067 | P&A | | | | Y | Y | Y | 05-04-61 | |
| | | 391-00153 | P&A | | | | Y | Y | Y | 04-01-42 | |
| | | 391-00172 | P&A | | | | Y | Y | Y | 08-25-41 | |
| | | | | | | | | | | | |
| | Mary Ellen O'Conn | | | | | | | | | | |
| | | 391-01817 | P&A | | | | Y | Y | Y | 03-11-55 | |
| | | 391-01863 | P&A | | | | Y | Y | Y | 04-19-56 | |
| | | 391-01890 | P&A | | | | Y | Y | Y | 01-31-73 | *Post 66.* |

Table 3.30: Continued

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 391-01913 | P&A | | | | Y | Y | Y | 02-01-55 | |
| | | 391-01916 | P&A | | | | Y | Y | Y | 01-28-54 | |
| | | 391-01932 | P&A | | | | Y | Y | Y | 03-21-55 | |
| | | 391-01951 | P&A | | | | Y | Y | Y | 04-11-72 | *Post 66.* |
| | | 391-01956 | P&A | | | | Y | Y | Y | 02-15-55 | |
| | | 391-01971 | P&A | | | | Y | Y | Y | 04-19-56 | |
| | | 391-03805 | P&A | | | | Y | Y | Y | 03-05-64 | |
| | | | | | | | | | | | |
| | Refugio New | | | | | | | | | | |
| | | 391-02188 | P&A | | | | Y | Y | Y | 04-15-49 | |
| | | 391-02988 | P&A | | | | Y | Y | Y | 03-24-61 | |
| | | 391-02995 | P&A | | | | Y | Y | Y | 04-19-40 | |
| | | | | | | | | | | | |
| | Refugio Old | | | | | | | | | | |
| | | 391-01985 | P&A | | | | Y | Y | Y | 01-07-57 | |
| | | 391-01987 | P&A | | | | Y | Y | Y | 04-14-87 | *Post 66.* |
| | | 391-01992 | P&A | | | | Y | Y | Y | 12-25-57 | |
| | | 391-02186 | P&A | | | | Y | Y | Y | 06-18-47 | |
| | | 391-02240 | P&A | | | | Y | Y | Y | 03-16-56 | |
| | | 391-02276 | P&A? | na | 1 | 1 | N | Y | Y | - | No Form 4 or P&A data. Only Form 1. |
| | | 391-02293 | P&A? | na | 1 | 1 | N | Y | Y | - | No Form 4 or P&A data. Only Form 1. |
| | | 391-02308 | P&A | | | | Y | Y | Y | 06-05-47 | |
| | | 391-02346 | P&A | | | | Y | Y | Y | 08-11-60 | |
| | | 391-02416 | P&A | | | | Y | Y | Y | 05-12-52 | |
| | | 391-02874 | P&A | | | | Y | Y | Y | 10-18-60 | *No intersection. TD:1536'* |
| | | 391-02901 | P&A | | | | Y | Y | Y | 04-23-63 | |
| | | | | | | | | | | | |
| | Tom O'Connor | | | | | | | | | | |
| | | 391-00414 | P&A | | | | Y | Y | Y | 11-11-61 | |
| | | 391-00474 | Shut-in | | | | na | Y | Y | na | |
| | | 391-00478 | P&A | | | | Y | Y | Y | 08-28-47 | |
| | | 391-00489 | P&A | | | | Y | Y | Y | 10-24-61 | |
| | | 391-00502 | P&A | | | | Y | Y | Y | 05-30-49 | |
| | | 391-00503 | P&A | | | | Y | Y | Y | 03-02-62 | |
| | | 391-00508 | P&A | | | | Y | Y | Y | 06-04-46 | |

Table 3.30: Continued

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 391-00523 | P&A | | | | Y | Y | Y | 12-23-49 | |
| | | 391-00530 | P&A | | | | Y | Y | Y | 01-15-62 | |
| | | 391-00541 | P&A | | | | Y | Y | Y | 07-16-52 | |
| | | 391-00675 | P&A | na | 1 | 1 | N | Y | Y | 03-27-37 | *Blowout. No Form 4; cement pumped.* |
| | | 391-00800 | P&A | | | | Y | Y | Y | 02-02-73 | *Post 66.* |
| | | 391-00849 | P&A | | | | Y | Y | Y | 04-13-50 | |
| | | 391-01318 | P&A | | | | Y | Y | Y | 08-15-38 | |
| | | 391-01350 | P&A? | na | 1 | 1 | N | Y | Y | - | No Form 4; Forms 1 & 2. |
| | | 391-01351 | P&A | | | | Y | Y | Y | 11-22-45 | |
| | | 391-01623 | P&A? | na | 1 | 1 | N | Y | Y | - | No Form 4. |
| | | 391-01674 | P&A | | | | Y | Y | Y | 11-17-49 | |
| | | 391-01721 | P&A | | | | Y | Y | Y | 02-12-38 | |
| | | 391-01761 | P&A | | | | Y | Y | Y | 11-23-50 | |
| | | 391-01768 | P&A | | | | Y | Y | Y | 02-11-50 | |
| | | 391-01772 | P&A? | na | 1 | 1 | N | Y | Y | - | No Form 4; Forms 1 & 2. |
| | | 391-01773 | P&A | | | | Y | Y | Y | 07-21-51 | |
| | | 391-01819 | P&A? | na | 1 | 1 | N | Y | Y | - | App. to plug, but no Form 4 or P&A data. |
| | | 391-01820 | P&A? | 2 | 3 | na | N | Y | Y | - | App. to plug, but no Form 4 or P&A data. |
| | | 391-02040 | P&A | | | | Y | Y | Y | 07-27-46 | |
| | | 391-03784 | Producer | | | | na | Y | Y | na | Gas well. |
| | | 391-03804 | P&A? | 1 | 1 | na | N | Y | Y | - | No Form 4 or P&A data. Only Form 1. |
| | | | | | | | | | | | |
| San Patricio | | | | | | | | | | | |
| | Midway | | | | | | | | | | |
| | | 409-02665 | P&A | | | | Y | Y | Y | 01-13-50 | |
| | | 409-02738 | P&A | | | | Y | Y | Y | 04-13-50 | |
| | | 409-02755 | P&A | | | | Y | Y | Y | 10-17-43 | |
| | | 409-02902 | P&A | | | | Y | Y | Y | 12-02-48 | |
| | | 409-02905 | P&A | | | | Y | Y | Y | 07-08-53 | |
| | | 409-02934 | P&A | | | | Y | Y | Y | 01-18-52 | |
| | | 409-04062 | P&A | | | | Y | Y | Y | 09-26-64 | |
| | | | | | | | | | | | |
| | Odem | | | | | | | | | | |
| | | 409-03782 | P&A | | | | Y | Y | Y | 06-05-42 | |
| | | 409-03876 | P&A | | | | Y | Y | Y | 04-20-66 | |

Table 3.30: Continued

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Plymouth | | | | | | | | | | |
| | | 409-01251 | P&A | | | | Y | Y | Y | 03-26-37 | |
| | | 409-01474 | P&A | | | | Y | Y | Y | 10-28-36 | |
| | | 409-01517 | P&A | | | | Y | Y | Y | 02-06-63 | |
| | | 409-01526 | P&A? | na | 1 | 1 | N | Y | Y | - | Form 3 only. |
| | | 409-01842 | P&A | | | | Y | Y | Y | 01-21-38 | |
| | | | | | | | | | | | |
| | Plymouth E. | | | | | | | | | | |
| | | 409-02076 | P&A | | | | Y | Y | Y | 03-21-54 | |
| | | 409-02080 | P&A | | | | Y | Y | Y | 09-15-70 | *Post 66.* |
| | | | | | | | | | | | |
| | Portilla | | | | | | | | | | |
| | | 409-01728 | P&A | | | | Y | Y | Y | 07-27-53 | |
| | | | | | | | | | | | |
| | Sinton W. | | | | | | | | | | |
| | | 409-00418 | P&A | | | | Y | Y | Y | 12-16-48 | |
| | | 409-00456 | P&A? | 1 | na | na | N | Y | Y | - | Forms 1, 2 & SW-1. |
| | | 409-00557 | P&A | | | | Y | Y | Y | 09-10-50 | |
| | | 409-00642 | P&A | | | | Y | Y | Y | 06-05-62 | |
| | | 409-00710 | P&A | | | | Y | Y | Y | 10-08-50 | |
| | | 409-00842 | P&A? | na | 1 | 1 | N | Y | Y | - | Form 1 only. |
| | | | | | | | | | | | |
| | Taft | | | | | | | | | | |
| | | 409-01305 | P&A? | na | 1 | 1 | N | Y | Y | - | Form 1 only. |
| | | 409-01345 | P&A | | | | Y | Y | Y | 12-19-52 | |
| | | 409-01972 | P&A | | | | Y | Y | Y | 12-28-37 | |
| | | | | | | | | | | | |
| | White Point E. | | | | | | | | | | |
| | | 409-02813 | P&A | | | | Y | Y | Y | 08-21-50 | |
| | | 409-03189 | Producer | - | - | - | na | Y | Y | na | |
| | | 409-03335 | P&A | | | | Y | Y | Y | 08-25-54 | |
| | | | | | | | | | | | |
| Starr | | | | | | | | | | | |
| | Garcia | | | | | | | | | | |

Table 3.30: Continued

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 427-03906 | P&A | | | | Y | Y | Y | 04-01-48 | |
| | | 427-04083 | P&A | | | | Y | Y | Y | 03-27-52 | |
| | | 427-04094 | P&A | | | | Y | Y | Y | 12-24-50 | |
| | | 427-04229 | P&A | | | | Y | Y | Y | 03-07-46 | |
| | | 427-04233 | P&A | | | | Y | Y | Y | 01-06-54 | |
| | | 427-04250 | P&A | | | | Y | Y | Y | 06-29-44 | |
| | | | | | | | | | | | |
| | Jay Simmons | | | | | | | | | | |
| | | 427-00305 | Producer | - | - | - | na | Y | Y | na | |
| | | 427-00374 | P&A | | | | Y | Y | Y | 01-02-58 | |
| | | | | | | | | | | | |
| | Kelsey S. | | | | | | | | | | |
| | | 427-00196 | P&A | | | | Y | Y | Y | 09-21-84 | *Post 66.* |
| | | 427-00336 | P&A | | | | Y | Y | Y | 02-02-49 | |
| | | 427-04800 | P&A | | | | Y | Y | Y | 03-07-66 | |
| | | | | | | | | | | | |
| | Reyna | | | | | | | | | | |
| | | 427-02365 | P&A | | | | Y | Y | Y | 03-21-56 | |
| | | | | | | | | | | | |
| | Ricaby | | | | | | | | | | |
| | | 427-02969 | P&A | | | | Y | Y | Y | 01-16-57 | |
| | | 427-02973 | P&A? | na | 1 | 1 | N | Y | Y | - | No Forms. |
| | | 427-03038 | P&A | | | | Y | Y | Y | 05-27-50 | |
| | | 427-03131 | P&A? | na | 1 | 1 | N | Y | Y | - | Forms 1 &2. |
| | | | | | | | | | | | |
| | Rincon | | | | | | | | | | |
| | | 427-01493 | P&A | | | | Y | Y | Y | 04-25-52 | |
| | | 427-01536 | P&A | | | | Y | Y | Y | 06-03-41 | |
| | | 427-03005 | P&A | | | | Y | Y | Y | 11-21-41 | |
| | | 427-03382 | P&A | | | | Y | Y | Y | 02-21-52 | |
| | | 427-03390 | P&A | | | | Y | Y | Y | 05-22-44 | |
| | | 427-03709 | P&A | | | | Y | Y | Y | 11-05-50 | |
| | | 427-03729 | P&A | | | | Y | Y | Y | 04-10-55 | |
| | | 427-03743 | P&A | | | | Y | Y | Y | 02-24-51 | |
| | | 427-03756 | P&A | | | | Y | Y | Y | 12-30-51 | |

Table 3.30: Continued

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 427-03759 | P&A | | | | Y | Y | Y | 06-19-43 | |
| | | 427-03866 | P&A | | | | Y | Y | Y | 01-10-51 | |
| | | 427-03878 | P&A | | | | Y | Y | Y | 08-26-52 | |
| | | | | | | | | | | | |
| | Sun | | | | | | | | | | |
| | | 427-00899 | P&A | | | | Y | Y | Y | 05-19-48 | |
| | | 427-00941 | P&A | | | | Y | Y | Y | 05-13-40 | |
| | | 427-04418 | P&A | | | | Y | Y | Y | 12-27-63 | |
| | | 427-04873 | P&A | | | | Y | Y | Y | 08-10-79 | *Post 66.* |
| | | | | | | | | | | | |
| | Sun N. | | | | | | | | | | |
| | | 427-00493 | P&A | | | | Y | Y | Y | 11-03-43 | |
| | | 427-00508 | P&A | | | | Y | Y | Y | 02-27-48 | |
| | | 427-00619 | P&A | | | | Y | Y | Y | 08-02-63 | |
| | | 427-00640 | P&A | | | | Y | Y | Y | 08-29-59 | |
| | | 427-00648 | P&A | | | | Y | Y | Y | 04-22-47 | |
| | | 427-00654 | P&A | | | | Y | Y | Y | 06-22-47 | |
| | | 427-04704 | P&A | | | | Y | Y | Y | 09-26-65 | |
| | | | | | | | | | | | |
| Victoria | | | | | | | | | | | |
| | Bloomington | | | | | | | | | | |
| | | 469-01684 | P&A | | | | Y | Y | Y | 06-30-52 | |
| | | 469-02896 | P&A | | | | Y | Y | Y | 01-08-66 | |
| | | | | | | | | | | | |
| | Coletto Creek | | | | | | | | | | |
| | | 469-01124 | P&A? | na | 1 | 1 | N | Y | Y | - | Forms 1 & 2. |
| | | 469-01223 | Injector | | | | na | Y | Y | na | |
| | | 469-01336 | P&A | | | | Y | Y | Y | 08-05-54 | |
| | | | | | | | | | | | |
| | Helen Gohlke | | | | | | | | | | |
| | | 469-00106 | P&A | | | | Y | Y | Y | 04-20-52 | |
| | | | | | | | | | | | |
| | Helen Gohlke W. | | | | | | | | | | |
| | | 469-00067 | P&A | | | | Y | Y | Y | 10-27-53 | |
| | | | | | | | | | | | |

Table 3.30: Continued

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Heyser | | | | | | | | | | |
| | | 469-01986 | P&A | | | | Y | Y | Y | 10-20-38 | |
| | | | | | | | | | | | |
| | Keeran | | | | | | | | | | |
| | | 469-00238 | P&A | | | | Y | Y | Y | 02-20-62 | |
| | | 469-02949 | P&A | | | | Y | Y | Y | 03-14-66 | |
| | | | | | | | | | | | |
| | McFaddin | | | | | | | | | | |
| | | 469-01570 | P&A | | | | Y | Y | Y | 07-18-32 | *No intersection. TD: 2840'* |
| | | 469-02282 | P&A | | | | Y | Y | Y | 09-04-54 | |
| | | | | | | | | | | | |
| | Placedo | | | | | | | | | | |
| | | 469-01868 | P&A | | | | Y | Y | Y | 10-17-53 | |
| | | 469-01879 | P&A | | | | Y | Y | Y | 02-05-42 | |
| | | 469-01972 | P&A | | | | Y | Y | Y | 04-13-63 | |
| | | 469-02583 | P&A | | | | Y | Y | Y | 05-27-56 | |
| | | | | | | | | | | | |
| | Placedo E. | | | | | | | | | | |
| | | 469-02710 | P&A | | | | Y | Y | Y | 07-10-53 | |
| | | 469-02749 | P&A | | | | Y | Y | Y | 09-23-59 | |
| | | 469-02812 | P&A | | | | Y | Y | Y | 06-29-55 | |
| | | | | | | | | | | | |
| | Pridham Lake | | | | | | | | | | |
| | | 469-00994 | P&A | | | | Y | Y | Y | 01-06-60 | |
| | | 469-01041 | P&A? | 1 | na | na | N | Y | Y | - | Form 1 only. |

Table 3.30: Continued

# APPENDIX 1

Listing of selected data for TRRC UIC database
wells in Texas Gulf Coast study fields

MONITORING REPORT (FORM H-10) STATUS CODES (ON THE LAST DAY OF H-10 CYCLE)

-----------------------------------------------------------------

1 AUTHORIZED TO INJECT, BUT NOT YET DRILLED
2 DRILLED BUT NOT YET CONVERTED TO INJ/DISP
3 ACTIVE INJECTION/DISPOSAL
4 TEMPORARILY ABANDONED/SHUT-IN
5 OTHER (OLD FORM H-10) / CONV. TO PROD. (NEW FORM H-10, >=09/01/93)
6* PERMIT CANCELLED
7* WELL PLUGGED AND ABANDONED
8* WELL PLUGGED AND ABANDONED AND PERMIT CANCELLED
9 OTHER STATUS (MISC. STATUS FROM NEW H-10 FORMS, MAILED >=09/01/93)

Selected Injection Well Data from the
Texas RRC UIC Database

County : BRAZORIA
Field (Reservoir) : BRYAN MOUND

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 3931253 | 8 | 0/ 0/ 0 | 0 | 4610 |
| 3931284 | 8 | 0/ 0/ 0 | 0 | 5710 |
| 3931259 | 8 | 0/ 0/ 0 | 0 | 5650 |
| 3931332 | 8 | 0/ 0/ 0 | 0 | 5885 |
| 3931260 | 8 | 0/ 0/ 0 | 0 | 5680 |
| 3931288 | 8 | 0/ 0/ 0 | 0 | 5742 |
| 3900000 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3900000 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931372 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931373 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3900000 | 4 | 0/ 0/ 0 | 0 | 0 |
| 3931383 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931385 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931388 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931387 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931421 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931390 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931398 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931402 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931391 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931393 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931368 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931361 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931376 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931379 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931404 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931405 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931329 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931410 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931413 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931814 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931816 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931818 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931820 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931371 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931397 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931345 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931399 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931400 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931403 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931363 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931392 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931380 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931328 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931394 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931375 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931411 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931815 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931817 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931819 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931821 | 3 | 0/ 0/ 0 | 0 | 0 |

| | | | | |
|---|---|---|---|---|
| 3931263 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931374 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931415 | 3 | 0/ 0/ 0 | 0 | 0 |

Selected Injection Well Data from the Texas RRC UIC Database

County : BRAZORIA
Field (Reservoir) : DAMON MOUND

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 3981672 | 8 | 12/13/60 | 0 | 2238 |
| 3902500 | 6 | 1/ 1/ 1 | 1550 | 0 |
| 3902514 | 8 | 0/ 0/ 0 | 900 | 2698 |
| 3902109 | 7 | 0/ 0/ 0 | 0 | 0 |
| 3902531 | 3 | 2/19/60 | 950 | 1060 |
| 3902315 | 3 | 9/12/69 | 1100 | 3052 |
| 3902148 | 4 | 11/10/78 | 1000 | 1980 |
| 3902483 | 3 | 11/29/71 | 950 | 1982 |
| 3902101 | 3 | 7/ 3/68 | 600 | 1615 |
| 3980524 | 7 | 2/27/67 | 480 | 950 |
| 3902514 | 8 | 0/ 0/ 0 | 0 | 0 |
| 3980513 | 3 | 2/16/68 | 1000 | 2214 |
| 3931294 | 3 | 0/ 0/ 0 | 0 | 4500 |
| 3902514 | 8 | 9/18/75 | 900 | 2698 |
| 3905003 | 4 | 8/ 4/69 | 900 | 1104 |
| 3902686 | 3 | 0/ 0/ 0 | 0 | 3015 |
| 3932331 | 7 | 7/ 7/89 | 1150 | 3000 |
| 3932127 | 2 | 5/ 7/90 | 1000 | 3990 |
| 3932373 | 8 | 1/28/91 | 1100 | 4700 |
| 3932032 | 2 | 6/10/91 | 900 | 2774 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : BRAZORIA
Field (Reservoir) : DAMON MOUND EAST (FLT BLK 1)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 3902198 | 3 | 1/27/77 | 0 | 1855 |
| 3902195 | 6 | 9/13/68 | 0 | 1850 |
| 3902194 | 6 | 10/21/70 | 0 | 3956 |
| 3902248 | 3 | 6/ 9/76 | 1000 | 4512 |
| 3981880 | 4 | 10/28/69 | 1150 | 1944 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : BRAZORIA
Field (Reservoir) : DANBURY DOME
Field (Reservoir) : DANBURY DOME (F-5-B)
Field (Reservoir) : DANBURY DOME (5655 SAND)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 3901657 | 8 | 6/20/72 | 0 | 3280 |
| 3901649 | 8 | 5/ 4/62 | 0 | 2260 |
| 3901738 | 8 | 5/ 9/80 | 1000 | 1832 |
| 3904262 | 7 | 0/ 0/ 0 | 0 | 2300 |
| 3901620 | 8 | 6/ 7/73 | 1200 | 1600 |
| 3901629 | 8 | 0/ 0/ 0 | 1250 | 2000 |
| 3981388 | 8 | 11/ 8/73 | 900 | 1900 |
| 3931559 | 3 | 9/13/82 | 0 | 0 |
| 3901618 | 3 | 0/ 0/ 0 | 0 | 2000 |
| 3901656 | 3 | 0/ 0/ 0 | 0 | 1956 |
| 3901672 | 3 | 9/21/92 | 1000 | 1750 |
| 3901734 | 3 | 1/15/93 | 750 | 1600 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : BRAZORIA
Field (Reservoir) : HASTINGS EAST

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 3900578 | 7 | 7/24/73 | 0 | 2300 |
| 3900580 | 8 | 11/ 3/69 | 1650 | 2000 |
| 3900697 | 8 | 10/19/79 | 1200 | 2400 |
| 3900743 | 3 | 0/ 0/ 0 | 0 | 2000 |
| 3900746 | 3 | 8/25/55 | 0 | 1850 |
| 3900747 | 7 | 7/15/55 | 0 | 2174 |
| 3900750 | 3 | 0/ 0/ 0 | 0 | 1900 |
| 3900768 | 7 | 0/ 0/ 0 | 0 | 1900 |
| 3931264 | 3 | 11/ 8/79 | 1200 | 1900 |
| 3900681 | 8 | 9/13/78 | 1410 | 2750 |
| 3900690 | 8 | 9/27/73 | 0 | 2300 |
| 3900647 | 4 | 7/24/74 | 1200 | 2320 |
| 3900606 | 3 | 0/ 0/ 0 | 1200 | 2300 |
| 3900608 | 7 | 0/ 0/ 0 | 0 | 2000 |
| 3900648 | 8 | 7/24/78 | 1200 | 2500 |
| 3900526 | 4 | 11/25/68 | 1200 | 2100 |
| 3900525 | 3 | 10/28/53 | 1300 | 1930 |
| 3900510 | 4 | 7/15/77 | 1700 | 2500 |
| 3900512 | 8 | 2/10/54 | 1200 | 1930 |
| 3900513 | 8 | 3/ 1/73 | 0 | 2100 |
| 3900520 | 7 | 5/12/75 | 1600 | 1830 |
| 3900624 | 4 | 11/18/66 | 1500 | 2100 |
| 3931282 | 3 | 0/ 0/ 0 | 0 | 1950 |
| 3900533 | 7 | 9/26/83 | 1550 | 2500 |
| 3981066 | 7 | 0/ 0/ 0 | 0 | 2300 |
| 3900579 | 8 | 0/ 0/ 0 | 0 | 2300 |
| 3930732 | 3 | 0/ 0/ 0 | 0 | 1950 |
| 3930499 | 3 | 4/17/85 | 1200 | 3000 |
| 3900682 | 7 | 0/ 0/ 0 | 0 | 2000 |
| 3900623 | 3 | 2/ 1/89 | 1425 | 2550 |
| 3931261 | 4 | 9/16/91 | 1650 | 4050 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : BRAZORIA
Field (Reservoir) : HOSKINS MOUND

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 3904934 | 3 | 3/10/67 | 1000 | 1331 |
| 3905040 | 8 | 0/ 0/ 0 | 0 | 5894 |
| 3904988 | 6 | 0/ 0/ 0 | 0 | 4720 |
| 3904984 | 6 | 0/ 0/ 0 | 0 | 5160 |
| 3904993 | 6 | 0/ 0/ 0 | 0 | 5311 |
| 3930059 | 6 | 0/ 0/ 0 | 0 | 5059 |
| 3930161 | 6 | 0/ 0/ 0 | 0 | 5546 |
| 3930347 | 6 | 0/ 0/ 0 | 0 | 5792 |
| 3930363 | 6 | 0/ 0/ 0 | 0 | 5040 |
| 3930389 | 6 | 0/ 0/ 0 | 0 | 5611 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : BRAZORIA
Field (Reservoir) : LOCHRIDGE

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 3901849 | 4 | 4/10/50 | 1300 | 2458 |
| 3901878 | 3 | 10/25/68 | 0 | 1900 |
| 3980614 | 3 | 7/11/79 | 1300 | 2645 |
| 3901868 | 7 | 12/12/90 | 1300 | 3220 |
| 3901871 | 3 | 12/21/93 | 1250 | 2510 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : BRAZORIA
Field (Reservoir) : MANVEL (BASAL MIOCENE)
Field (Reservoir) : MANVEL (F.B. I OLIGOCENE)
Field (Reservoir) : MANVEL (F.B. II OLIGOCENE)
Field (Reservoir) : MANVEL (FB-III OLIGOCENE)
Field (Reservoir) : MANVEL (FB-III OLIGOCENE SEG A)
Field (Reservoir) : MANVEL (MIOCENE)
Field (Reservoir) : MANVEL (FRIO -E-)
Field (Reservoir) : MANVEL (MIOCENE 3600)
Field (Reservoir) : MANVEL (4970)
Field (Reservoir) : MANVEL (FB-III OLIGOCENE -C-)
Field (Reservoir) : MANVEL

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 3981667 | 8 | 12/18/78 | 0 | 4330 |
| 3981496 | 3 | 6/20/68 | 1600 | 1950 |
| 3901274 | 3 | 9/23/74 | 1850 | 2060 |
| 3901289 | 3 | 2/ 8/73 | 1650 | 2100 |
| 3901295 | 7 | 0/ 0/ 0 | 0 | 0 |
| 3931215 | 3 | 8/ 6/79 | 1650 | 5600 |
| 3901315 | 7 | 3/ 9/64 | 0 | 2448 |
| 3901321 | 4 | 12/13/71 | 1650 | 4240 |
| 3901243 | 3 | 11/11/74 | 1650 | 2300 |
| 3981669 | 4 | 8/ 9/63 | 1650 | 2000 |
| 3901265 | 6 | 0/ 0/ 0 | 1850 | 2120 |
| 3900139 | 6 | 1/ 1/ 1 | 1100 | 0 |
| 3900022 | 3 | 5/11/73 | 1850 | 2300 |
| 3904860 | 7 | 6/21/72 | 950 | 5238 |
| 3930487 | 8 | 1/22/75 | 0 | 5422 |
| 3930698 | 4 | 1/22/75 | 1100 | 5412 |
| 3900199 | 8 | 0/ 0/ 0 | 0 | 0 |
| 3900200 | 8 | 1/ 7/75 | 2000 | 2550 |
| 3980621 | 8 | 9/ 3/76 | 1250 | 1650 |
| 3901232 | 3 | 7/15/77 | 1600 | 2160 |
| 3901239 | 3 | 7/15/77 | 1650 | 2370 |
| 3930373 | 8 | 0/ 0/ 0 | 0 | 0 |
| 3900203 | 3 | 9/23/76 | 100 | 2300 |
| 3901271 | 3 | 5/19/72 | 1650 | 2200 |
| 3900176 | 3 | 7/ 5/74 | 1600 | 2000 |
| 3900185 | 8 | 5/14/71 | 2000 | 4100 |
| 3900163 | 7 | 11/27/72 | 0 | 2600 |
| 3900147 | 3 | 10/18/76 | 0 | 2580 |
| 3900162 | 3 | 3/ 9/64 | 1900 | 2600 |
| 3900144 | 4 | 12/ 9/80 | 1900 | 5760 |
| 3930346 | 3 | 10/10/74 | 2000 | 4600 |
| 3901262 | 6 | 12/ 5/72 | 0 | 2600 |
| 3901292 | 8 | 8/25/64 | 1650 | 2000 |
| 3900163 | 8 | 11/27/72 | 0 | 2600 |
| 3931568 | 4 | 9/ 3/82 | 1550 | 1965 |
| 3930487 | 5 | 5/10/83 | 0 | 0 |
| 3900151 | 8 | 3/31/82 | 1850 | 2450 |
| 3901301 | 7 | 0/ 0/ 0 | 0 | 0 |
| 3901275 | 8 | 0/ 0/ 0 | 0 | 5097 |
| 3901276 | 8 | 0/ 0/ 0 | 0 | 5029 |
| 3901279 | 6 | 0/ 0/ 0 | 0 | 5015 |

| | | | | |
|---|---|---|---|---|
| 3901280 | 8 | 0/ 0/ 0 | 0 | 5052 |
| 3901282 | 8 | 0/ 0/ 0 | 0 | 5030 |
| 3901286 | 6 | 0/ 0/ 0 | 0 | 5054 |
| 3901287 | 6 | 0/ 0/ 0 | 0 | 5046 |
| 3901294 | 6 | 0/ 0/ 0 | 0 | 5089 |
| 3901297 | 8 | 0/ 0/ 0 | 0 | 4991 |
| 3901298 | 6 | 0/ 0/ 0 | 0 | 5086 |
| 3901300 | 6 | 0/ 0/ 0 | 0 | 5097 |
| 3930188 | 6 | 0/ 0/ 0 | 0 | 5052 |
| 3930333 | 6 | 0/ 0/ 0 | 0 | 5010 |
| 3930502 | 6 | 0/ 0/ 0 | 0 | 5020 |
| 3930503 | 6 | 0/ 0/ 0 | 0 | 5008 |
| 3930686 | 6 | 0/ 0/ 0 | 0 | 4952 |
| 3930525 | 6 | 0/ 0/ 0 | 0 | 5090 |
| 3930529 | 6 | 0/ 0/ 0 | 0 | 5076 |
| 3930527 | 6 | 0/ 0/ 0 | 0 | 5133 |
| 3931217 | 6 | 0/ 0/ 0 | 0 | 5036 |
| 3931216 | 6 | 0/ 0/ 0 | 0 | 4981 |
| 3930277 | 3 | 1/17/84 | 0 | 2350 |
| 3900125 | 8 | 6/24/88 | 1900 | 3999 |
| 3930690 | 3 | 4/ 9/90 | 1825 | 2740 |
| 3930384 | 3 | 3/ 9/92 | 1850 | 5586 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : BRAZORIA
Field (Reservoir) : NASH DOME

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 3901955 | 7 | 7/ 2/51 | 0 | 3212 |
| 3901969 | 7 | 8/ 8/68 | 0 | 4486 |
| 3930035 | 7 | 10/ 1/69 | 0 | 4452 |
| 3930763 | 3 | 9/21/81 | 1150 | 4510 |
| 3931214 | 3 | 6/18/85 | 0 | 4610 |
| 3931338 | 6 | 6/18/84 | 0 | 4510 |
| 3901981 | 6 | 10/17/85 | 0 | 5922 |
| 3930028 | 4 | 10/17/85 | 0 | 5703 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : BRAZORIA
Field (Reservoir) : OLD OCEAN (ARMSTRONG)
Field (Reservoir) : OLD OCEAN (F- 8)
Field (Reservoir) : OLD OCEAN (CHENAULT)
Field (Reservoir) : OLD OCEAN (LARSEN)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 3903963 | 3 | 3/ 4/68 | 1100 | 1698 |
| 3903980 | 6 | 0/ 0/ 0 | 0 | 0 |
| 3980798 | 6 | 11/14/67 | 0 | 1675 |
| 3931250 | 4 | 5/16/78 | 1200 | 2100 |
| 3903983 | 6 | 5/17/49 | 0 | 0 |
| 3903980 | 6 | 2/28/55 | 0 | 0 |
| 3903975 | 6 | 10/27/59 | 0 | 0 |
| 3903960 | 6 | 10/ 3/58 | 0 | 0 |
| 3903961 | 6 | 8/20/48 | 0 | 0 |
| 3903984 | 6 | 3/15/48 | 0 | 0 |
| 3902820 | 6 | 12/19/47 | 0 | 0 |
| 3903982 | 6 | 5/14/48 | 0 | 0 |
| 3903949 | 4 | 0/ 0/ 0 | 0 | 0 |
| 3904041 | 8 | 11/12/82 | 1000 | 6900 |
| 3903911 | 6 | 11/12/82 | 0 | 0 |
| 3904078 | 8 | 11/12/82 | 0 | 0 |
| 3903900 | 6 | 11/12/82 | 0 | 0 |
| 3903910 | 4 | 11/12/82 | 1000 | 6900 |
| 3902848 | 4 | 1/19/89 | 1000 | 6900 |
| 3980070 | 4 | 1/19/89 | 1000 | 6900 |
| 3903961 | 3 | 4/ 2/90 | 1050 | 1800 |
| 3904054 | 4 | 8/14/90 | 1000 | 6000 |
| 3903909 | 4 | 8/21/90 | 1000 | 6900 |
| 3904057 | 4 | 8/21/90 | 1000 | 6900 |
| 3904040 | 4 | 8/21/90 | 1000 | 6900 |
| 3904044 | 4 | 8/21/90 | 1000 | 6900 |
| 3904043 | 4 | 8/21/90 | 1000 | 6900 |
| 3904042 | 7 | 8/21/90 | 1000 | 6900 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : BRAZORIA
Field (Reservoir) : WEST COLUMBIA

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 3980830 | 3 | 1/29/52 | 1000 | 1646 |
| 3903609 | 8 | 0/ 0/ 0 | 0 | 0 |
| 3930581 | 7 | 8/25/76 | 0 | 1350 |
| 3903686 | 7 | 0/ 0/ 0 | 0 | 0 |
| 3980835 | 8 | 9/16/57 | 0 | 700 |
| 3903220 | 8 | 2/10/59 | 100 | 873 |
| 3903151 | 7 | 0/ 0/ 0 | 0 | 0 |
| 3903550 | 8 | 0/ 0/ 0 | 0 | 0 |
| 3905005 | 3 | 3/19/69 | 1000 | 1720 |
| 3903344 | 7 | 5/25/53 | 0 | 738 |
| 3980842 | 3 | 2/ 3/72 | 550 | 590 |
| 3903356 | 3 | 0/ 0/ 0 | 800 | 733 |
| 3903337 | 3 | 8/ 7/53 | 0 | 770 |
| 3903156 | 7 | 0/ 0/ 0 | 900 | 2335 |
| 3903433 | 7 | 0/ 0/ 0 | 0 | 0 |
| 3903289 | 6 | 0/ 0/ 0 | 0 | 0 |
| 3900000 | 6 | 0/ 0/ 0 | 0 | 0 |
| 3903350 | 6 | 0/ 0/ 0 | 0 | 0 |
| 3903321 | 6 | 0/ 0/ 0 | 0 | 0 |
| 3903370 | 6 | 0/ 0/ 0 | 0 | 0 |
| 3903372 | 6 | 0/ 0/ 0 | 0 | 3370 |
| 3903374 | 6 | 0/ 0/ 0 | 0 | 0 |
| 3900000 | 6 | 0/ 0/ 0 | 0 | 0 |
| 3905016 | 6 | 0/ 0/ 0 | 0 | 0 |
| 3905122 | 6 | 0/ 0/ 0 | 0 | 0 |
| 3930031 | 6 | 0/ 0/ 0 | 0 | 0 |
| 3930048 | 6 | 0/ 0/ 0 | 0 | 0 |
| 3900000 | 6 | 0/ 0/ 0 | 0 | 0 |
| 3930101 | 6 | 0/ 0/ 0 | 0 | 0 |
| 3930108 | 6 | 0/ 0/ 0 | 0 | 0 |
| 3930107 | 6 | 0/ 0/ 0 | 0 | 0 |
| 3930156 | 6 | 0/ 0/ 0 | 0 | 0 |
| 3930186 | 6 | 0/ 0/ 0 | 0 | 0 |
| 3930189 | 6 | 0/ 0/ 0 | 0 | 0 |
| 3930176 | 6 | 0/ 0/ 0 | 0 | 0 |
| 3903331 | 7 | 0/ 0/ 0 | 0 | 1800 |
| 3903371 | 7 | 0/ 0/ 0 | 0 | 1200 |
| 3930297 | 7 | 0/ 0/ 0 | 0 | 1600 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : CHAMBERS
Field (Reservoir) : ANAHUAC
Field (Reservoir) : ANAHUAC (MARGINULINA 7100)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 7101452 | 8 | 6/12/78 | 0 | 6588 |
| 7101441 | 7 | 4/ 3/70 | 0 | 1350 |
| 7180545 | 7 | 0/ 0/ 0 | 0 | 2150 |
| 7101446 | 8 | 0/ 0/ 0 | 0 | 1009 |
| 7101453 | 8 | 0/ 0/ 0 | 0 | 6588 |
| 7101272 | 7 | 0/ 0/ 0 | 0 | 1500 |
| 7101445 | 8 | 10/10/78 | 650 | 1682 |
| 7101611 | 8 | 10/18/68 | 650 | 1400 |
| 7101625 | 8 | 12/12/72 | 450 | 1500 |
| 7101625 | 8 | 0/ 0/ 0 | 0 | 1500 |
| 7101613 | 8 | 0/ 0/ 0 | 400 | 1600 |
| 7101604 | 8 | 0/ 0/ 0 | 0 | 1800 |
| 7101599 | 8 | 4/ 3/70 | 0 | 1450 |
| 7101455 | 8 | 4/ 3/70 | 0 | 1800 |
| 7181999 | 8 | 7/13/54 | 400 | 1550 |
| 7101480 | 8 | 8/ 8/73 | 600 | 1260 |
| 7101246 | 8 | 10/ 2/74 | 600 | 1037 |
| 7101501 | 8 | 0/ 0/ 0 | 600 | 1550 |
| 7180657 | 8 | 6/12/78 | 0 | 6588 |
| 7180659 | 8 | 7/15/71 | 600 | 1200 |
| 7101454 | 8 | 11/10/65 | 0 | 1000 |
| 7101704 | 8 | 6/12/68 | 0 | 1065 |
| 7101699 | 4 | 9/19/73 | 400 | 1050 |
| 7101766 | 7 | 0/ 0/ 0 | 0 | 1532 |
| 7181987 | 8 | 4/ 3/70 | 0 | 1300 |
| 7130131 | 3 | 7/19/71 | 600 | 1200 |
| 7101392 | 8 | 2/23/56 | 0 | 2030 |
| 7101393 | 8 | 8/21/68 | 0 | 1570 |
| 7101395 | 8 | 3/12/75 | 0 | 1534 |
| 7101522 | 8 | 1/ 7/80 | 400 | 1775 |
| 7101571 | 4 | 3/31/78 | 1450 | 1690 |
| 7101560 | 4 | 4/22/68 | 1450 | 1870 |
| 7101743 | 4 | 2/26/68 | 400 | 2200 |
| 7180785 | 3 | 0/ 0/ 0 | 400 | 1400 |
| 7101294 | 8 | 1/27/76 | 0 | 1400 |
| 7101295 | 8 | 5/23/71 | 0 | 1358 |
| 7101296 | 4 | 7/24/74 | 500 | 1400 |
| 7101297 | 7 | 10/ 7/47 | 0 | 2290 |
| 7130002 | 4 | 0/ 0/ 0 | 100 | 1000 |
| 7101482 | 7 | 8/ 3/71 | 850 | 6912 |
| 7101519 | 6 | 3/26/64 | 400 | 6663 |
| 7101508 | 8 | 6/26/64 | 0 | 0 |
| 7101506 | 6 | 6/10/64 | 400 | 6872 |
| 7103285 | 6 | 3/17/70 | 850 | 6852 |
| 7101520 | 6 | 6/ 5/64 | 850 | 6705 |
| 7130854 | 8 | 1/ 8/80 | 400 | 2035 |
| 7130257 | 8 | 3/20/81 | 0 | 1800 |
| 7101495 | 8 | 7/30/71 | 0 | 0 |
| 7101615 | 8 | 0/ 0/ 0 | 400 | 1600 |
| 7101420 | 8 | 5/27/81 | 400 | 1600 |

| | | | | |
|---|---|---|---|---|
| 7101426 | 4 | 5/21/81 | 400 | 1600 |
| 7131329 | 3 | 8/ 4/82 | 400 | 1600 |
| 7101292 | 7 | 0/ 0/ 0 | 0 | 2300 |
| 7131174 | 3 | 12/10/82 | 400 | 1700 |
| 7180185 | 4 | 0/ 0/ 0 | 400 | 1730 |
| 7101445 | 8 | 0/ 0/ 0 | 0 | 1750 |
| 7100000 | 6 | 0/ 0/ 0 | 0 | 1800 |
| 7100000 | 6 | 0/ 0/ 0 | 0 | 1600 |
| 7101501 | 6 | 0/ 0/ 0 | 0 | 1550 |
| 7100000 | 6 | 0/ 0/ 0 | 0 | 1400 |
| 7101402 | 3 | 0/ 0/ 0 | 0 | 1800 |
| 7101701 | 3 | 2/15/85 | 400 | 1800 |
| 7130347 | 3 | 2/25/85 | 450 | 1800 |
| 7101708 | 7 | 2/ 5/85 | 400 | 1800 |
| 7101396 | 3 | 0/ 0/ 0 | 0 | 3580 |
| 7101403 | 4 | 3/ 9/89 | 400 | 3400 |
| 7101724 | 6 | 10/10/89 | 400 | 1250 |
| 7101554 | 3 | 5/15/90 | 400 | 1400 |
| 7131917 | 3 | 3/ 6/90 | 400 | 1670 |
| 7101409 | 4 | 10/23/91 | 400 | 1600 |
| 7101412 | 2 | 10/23/91 | 450 | 1600 |
| 7101425 | 2 | 10/23/91 | 450 | 1600 |
| 7101427 | 2 | 10/23/91 | 450 | 1600 |
| 7131427 | 3 | 10/23/91 | 400 | 1600 |
| 7131487 | 3 | 10/23/91 | 400 | 1600 |
| 7131968 | 3 | 2/14/92 | 400 | 1790 |
| 7130373 | 0 | 2/28/95 | 450 | 2000 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : CHAMBERS
Field (Reservoir) : BARBERS HILL

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 7100631 | 8 | 0/ 0/ 0 | 0 | 3630 |
| 7130881 | 8 | 0/ 0/ 0 | 0 | 1400 |
| 7100178 | 8 | 8/ 1/67 | 950 | 1900 |
| 7100299 | 6 | 8/ 1/67 | 700 | 995 |
| 7100451 | 6 | 8/ 1/67 | 700 | 1050 |
| 7100466 | 8 | 3/30/71 | 900 | 1300 |
| 7180792 | 7 | 10/ 7/75 | 0 | 2380 |
| 7100609 | 6 | 5/17/68 | 1100 | 1100 |
| 7100345 | 6 | 10/ 5/67 | 800 | 850 |
| 7130827 | 3 | 2/16/78 | 0 | 0 |
| 7130826 | 7 | 0/ 0/ 0 | 0 | 0 |
| 7130908 | 6 | 5/10/79 | 500 | 575 |
| 7181630 | 7 | 5/12/69 | 0 | 0 |
| 7130344 | 3 | 5/12/69 | 0 | 0 |
| 7181631 | 3 | 5/12/69 | 0 | 0 |
| 7181632 | 3 | 5/12/69 | 0 | 0 |
| 7130120 | 3 | 5/12/69 | 0 | 0 |
| 7181652 | 3 | 1/20/66 | 0 | 0 |
| 7130374 | 7 | 11/18/75 | 0 | 837 |
| 7181654 | 3 | 1/23/61 | 0 | 0 |
| 7181655 | 1 | 3/26/76 | 0 | 0 |
| 7181656 | 3 | 9/30/65 | 0 | 0 |
| 7181657 | 3 | 3/15/68 | 0 | 0 |
| 7181658 | 3 | 3/15/68 | 0 | 0 |
| 7130824 | 3 | 12/16/77 | 0 | 0 |
| 7100055 | 6 | 5/ 1/64 | 1000 | 1348 |
| 7100658 | 3 | 0/ 0/ 0 | 1000 | 2052 |
| 7100706 | 4 | 0/ 0/ 0 | 1470 | 3452 |
| 7103373 | 8 | 6/20/82 | 1420 | 2615 |
| 7100589 | 7 | 0/ 0/ 0 | 0 | 0 |
| 7103296 | 6 | 8/14/72 | 800 | 912 |
| 7181593 | 8 | 8/23/62 | 700 | 820 |
| 7181594 | 3 | 11/23/53 | 0 | 0 |
| 7181595 | 3 | 11/23/53 | 0 | 0 |
| 7181596 | 3 | 11/23/53 | 0 | 0 |
| 7181659 | 3 | 1/26/56 | 0 | 0 |
| 7181660 | 8 | 4/16/56 | 650 | 745 |
| 7181661 | 3 | 1/26/56 | 0 | 0 |
| 7181662 | 3 | 0/ 0/ 0 | 0 | 0 |
| 7181663 | 3 | 5/ 1/61 | 0 | 0 |
| 7130116 | 3 | 3/ 4/71 | 0 | 0 |
| 7130229 | 3 | 8/10/73 | 0 | 0 |
| 7130811 | 3 | 12/ 1/77 | 0 | 0 |
| 7130899 | 3 | 10/25/78 | 0 | 0 |
| 7130236 | 8 | 7/15/75 | 250 | 500 |
| 7181559 | 4 | 11/18/53 | 0 | 0 |
| 7181560 | 4 | 6/ 9/55 | 0 | 0 |
| 7181561 | 3 | 10/26/55 | 0 | 0 |
| 7130078 | 3 | 10/ 9/70 | 0 | 0 |
| 7130146 | 3 | 12/ 9/71 | 0 | 0 |
| 7130333 | 3 | 11/13/74 | 0 | 0 |

| | | | | |
|---|---|---|---|---|
| 7130378 | 3 | 6/30/75 | 0 | 0 |
| 7130441 | 3 | 1/30/76 | 0 | 0 |
| 7130503 | 3 | 9/17/76 | 0 | 0 |
| 7181563 | 3 | 8/17/59 | 0 | 0 |
| 7181564 | 3 | 5/25/59 | 0 | 0 |
| 7101533 | 3 | 2/23/60 | 0 | 0 |
| 7181566 | 3 | 3/28/61 | 0 | 0 |
| 7181567 | 3 | 9/ 5/61 | 0 | 0 |
| 7181568 | 3 | 5/24/62 | 0 | 0 |
| 7120164 | 3 | 5/26/69 | 0 | 0 |
| 7130079 | 3 | 1/20/71 | 0 | 0 |
| 7130153 | 3 | 2/ 8/72 | 0 | 0 |
| 7130202 | 3 | 2/13/73 | 0 | 0 |
| 7130216 | 3 | 4/23/73 | 0 | 0 |
| 7130237 | 3 | 10/ 5/73 | 0 | 0 |
| 7130269 | 3 | 2/21/74 | 0 | 0 |
| 7100267 | 6 | 11/13/69 | 0 | 0 |
| 7130293 | 6 | 6/19/74 | 156 | 800 |
| 7100783 | 3 | 6/21/73 | 0 | 5566 |
| 7181665 | 3 | 12/ 1/73 | 0 | 0 |
| 7181666 | 3 | 12/ 1/73 | 0 | 0 |
| 7130460 | 3 | 7/ 1/76 | 0 | 975 |
| 7181669 | 3 | 12/ 1/73 | 0 | 0 |
| 7130543 | 6 | 1/27/77 | 156 | 800 |
| 7181670 | 3 | 12/ 1/73 | 0 | 0 |
| 7181671 | 3 | 12/ 1/73 | 0 | 0 |
| 7181672 | 3 | 12/ 1/73 | 0 | 0 |
| 7181673 | 3 | 12/ 1/73 | 0 | 0 |
| 7181674 | 3 | 2/ 2/59 | 0 | 0 |
| 7181675 | 3 | 12/ 1/73 | 0 | 0 |
| 7181676 | 4 | 12/ 1/73 | 0 | 0 |
| 7181677 | 3 | 12/ 1/73 | 0 | 0 |
| 7181678 | 3 | 12/ 1/73 | 0 | 0 |
| 7181679 | 3 | 12/ 1/73 | 0 | 0 |
| 7181680 | 3 | 12/ 1/73 | 0 | 0 |
| 7181681 | 4 | 12/ 1/73 | 0 | 0 |
| 7120162 | 3 | 12/ 1/73 | 0 | 0 |
| 7120311 | 3 | 12/ 1/73 | 0 | 0 |
| 7130053 | 3 | 12/ 1/73 | 0 | 0 |
| 7181685 | 3 | 12/ 1/73 | 0 | 0 |
| 7130241 | 3 | 12/12/73 | 0 | 0 |
| 7130250 | 3 | 12/28/73 | 0 | 0 |
| 7181688 | 3 | 10/20/76 | 0 | 0 |
| 7130513 | 3 | 10/20/76 | 0 | 0 |
| 7130512 | 3 | 10/20/76 | 0 | 0 |
| 7130540 | 3 | 1/ 5/77 | 0 | 0 |
| 7130228 | 4 | 6/21/73 | 1500 | 5200 |
| 7181636 | 6 | 11/18/75 | 400 | 848 |
| 7130351 | 3 | 6/11/75 | 0 | 0 |
| 7130355 | 3 | 6/11/75 | 0 | 0 |
| 7130354 | 3 | 6/11/75 | 0 | 0 |
| 7181637 | 3 | 6/11/75 | 0 | 0 |
| 7181638 | 3 | 6/11/75 | 0 | 0 |
| 7130463 | 3 | 6/11/75 | 0 | 0 |
| 7130462 | 3 | 6/11/75 | 0 | 0 |
| 7130461 | 3 | 6/11/75 | 0 | 0 |
| 7181639 | 3 | 6/11/75 | 0 | 0 |
| 7130557 | 3 | 6/11/75 | 0 | 0 |
| 7130505 | 3 | 6/11/75 | 0 | 0 |
| 7130555 | 3 | 6/11/75 | 0 | 0 |

| | | | | |
|---|---|---|---|---|
| 7130556 | 3 | 6/11/75 | 0 | 0 |
| 7130983 | 3 | 11/16/78 | 0 | 0 |
| 7131021 | 3 | 11/16/78 | 0 | 0 |
| 7130952 | 6 | 11/28/79 | 650 | 900 |
| 7130985 | 3 | 11/16/78 | 0 | 0 |
| 7130956 | 3 | 6/11/75 | 0 | 0 |
| 7131056 | 3 | 6/11/75 | 0 | 0 |
| 7130874 | 6 | 0/ 0/ 0 | 0 | 0 |
| 7130272 | 4 | 4/ 2/71 | 0 | 0 |
| 7130122 | 3 | 2/ 5/75 | 0 | 0 |
| 7130121 | 3 | 2/ 5/75 | 0 | 0 |
| 7130134 | 3 | 7/16/71 | 0 | 0 |
| 7130265 | 4 | 2/21/74 | 0 | 0 |
| 7130436 | 3 | 1/29/76 | 0 | 0 |
| 7130385 | 3 | 7/16/75 | 0 | 0 |
| 7130386 | 3 | 8/15/80 | 0 | 0 |
| 7130266 | 3 | 2/21/74 | 0 | 0 |
| 7130039 | 3 | 2/ 5/75 | 0 | 0 |
| 7131237 | 3 | 6/29/59 | 0 | 0 |
| 7130526 | 6 | 10/ 1/79 | 0 | 6400 |
| 7181667 | 8 | 7/ 1/76 | 400 | 800 |
| 7181599 | 3 | 0/ 0/ 0 | 0 | 0 |
| 7130481 | 8 | 4/17/77 | 350 | 755 |
| 7181600 | 7 | 0/ 0/ 0 | 0 | 0 |
| 7181601 | 3 | 0/ 0/ 0 | 0 | 0 |
| 7181602 | 3 | 0/ 0/ 0 | 0 | 0 |
| 7181603 | 3 | 0/ 0/ 0 | 0 | 0 |
| 7181604 | 3 | 0/ 0/ 0 | 0 | 0 |
| 7181605 | 3 | 0/ 0/ 0 | 0 | 0 |
| 7130117 | 3 | 0/ 0/ 0 | 0 | 0 |
| 7130300 | 3 | 0/ 0/ 0 | 0 | 0 |
| 7130323 | 3 | 0/ 0/ 0 | 0 | 0 |
| 7130334 | 3 | 0/ 0/ 0 | 0 | 0 |
| 7130868 | 8 | 11/18/75 | 500 | 600 |
| 7130993 | 6 | 4/13/79 | 760 | 1120 |
| 7130870 | 6 | 4/13/79 | 760 | 1114 |
| 7181606 | 3 | 7/23/56 | 0 | 0 |
| 7131198 | 3 | 4/12/82 | 0 | 0 |
| 7131031 | 3 | 10/15/79 | 0 | 0 |
| 7131032 | 3 | 10/15/79 | 0 | 0 |
| 7130521 | 3 | 11/ 2/76 | 0 | 0 |
| 7100000 | 1 | 6/29/79 | 850 | 1000 |
| 7100000 | 6 | 0/ 0/ 0 | 400 | 800 |
| 7100000 | 6 | 0/ 0/ 0 | 0 | 800 |
| 7100000 | 6 | 3/19/79 | 900 | 1350 |
| 7130874 | 3 | 10/15/79 | 0 | 0 |
| 7100000 | 6 | 4/10/84 | 0 | 2104 |
| 7100120 | 7 | 0/ 0/ 0 | 0 | 2670 |
| 7131066 | 3 | 10/26/81 | 0 | 0 |
| 7131065 | 3 | 1/26/56 | 0 | 0 |
| 7130982 | 3 | 3/25/80 | 0 | 0 |
| 7130876 | 3 | 3/19/79 | 0 | 0 |
| 7130240 | 3 | 0/ 0/ 0 | 0 | 2380 |
| 7131034 | 3 | 0/ 0/ 0 | 0 | 0 |
| 7182024 | 3 | 0/ 0/ 0 | 0 | 0 |
| 7131562 | 4 | 1/13/88 | 1400 | 2960 |
| 7100000 | 6 | 0/ 0/ 0 | 0 | 0 |
| 7131830 | 8 | 7/18/88 | 1450 | 840 |
| 7182018 | 4 | 4/10/84 | 1450 | 2104 |
| 7131895 | 3 | 12/ 2/88 | 0 | 1800 |

| | | | | |
|---|---|---|---|---|
| 7131592 | 4 | 8/ 1/89 | 1525 | 2800 |
| 7131896 | 4 | 1/27/89 | 1800 | 5700 |
| 7182021 | 3 | 10/11/90 | 1400 | 2120 |
| 7131648 | 2 | 1/16/91 | 1500 | 2560 |
| 7131937 | 3 | 7/ 7/77 | 0 | 0 |
| 7130522 | 0 | 11/ 2/76 | 0 | 0 |
| 7132000 | 3 | 5/ 7/92 | 1700 | 5400 |
| 7130538 | 3 | 1/24/94 | 850 | 3410 |
| 7130577 | 3 | 1/24/94 | 850 | 3340 |
| 7130781 | 3 | 1/24/94 | 850 | 3455 |
| 7131977 | 3 | 2/24/94 | 800 | 3400 |
| 7131970 | 2 | 2/24/94 | 800 | 3600 |
| 7132016 | 0 | 11/ 5/93 | 0 | 5300 |
| 7132013 | 0 | 5/28/93 | 0 | 5700 |
| 7100000 | 0 | 5/ 7/92 | 1500 | 5700 |
| 7100000 | 0 | 2/ 6/89 | 1800 | 6500 |
| 7100000 | 0 | 2/ 6/89 | 1800 | 6500 |
| 7100000 | 0 | 2/ 6/89 | 1800 | 6500 |
| 7100000 | 0 | 2/14/89 | 1800 | 5600 |
| 7100000 | 0 | 2/14/89 | 1800 | 5600 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : CHAMBERS
Field (Reservoir) : FIG RIDGE
Field (Reservoir) : FIG RIDGE (SEABREEZE)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 7101939 | 7 | 4/ 7/54 | 850 | 8610 |
| 7101940 | 8 | 4/ 7/54 | 850 | 8671 |
| 7181584 | 4 | 4/ 7/54 | 850 | 8594 |
| 7120261 | 4 | 4/ 7/54 | 850 | 8620 |
| 7181587 | 8 | 3/ 4/63 | 400 | 1000 |
| 7101904 | 3 | 0/ 0/ 0 | 1250 | 2283 |
| 7101893 | 6 | 4/28/47 | 0 | 1600 |
| 7101883 | 6 | 4/28/67 | 0 | 2000 |
| 7101894 | 6 | 3/ 3/70 | 0 | 2000 |
| 7101889 | 6 | 11/22/72 | 0 | 2100 |
| 7181591 | 6 | 4/28/47 | 0 | 1600 |
| 7102127 | 6 | 5/18/76 | 0 | 1780 |
| 7101872 | 3 | 3/ 4/63 | 320 | 1000 |
| 7101892 | 7 | 4/28/47 | 0 | 1600 |
| 7101877 | 3 | 4/28/67 | 1035 | 2000 |
| 7101894 | 4 | 0/ 0/ 0 | 400 | 1700 |
| 7101889 | 4 | 11/22/72 | 400 | 2100 |
| 7102133 | 7 | 3/ 9/71 | 0 | 2930 |
| 7102143 | 7 | 8/22/72 | 0 | 2810 |
| 7101876 | 8 | 9/15/47 | 0 | 2970 |
| 7102138 | 3 | 0/ 0/ 0 | 400 | 3145 |
| 7102142 | 4 | 5/ 2/75 | 400 | 2690 |
| 7130842 | 3 | 0/ 0/ 0 | 900 | 1200 |
| 7131279 | 3 | 0/ 0/ 0 | 0 | 1750 |
| 7102103 | 3 | 3/24/83 | 400 | 1400 |
| 7100000 | 6 | 0/ 0/ 0 | 0 | 1780 |
| 7101896 | 4 | 0/ 0/ 0 | 0 | 1730 |
| 7102144 | 3 | 0/ 0/ 0 | 0 | 1750 |
| 7102127 | 4 | 7/30/85 | 0 | 3702 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : CHAMBERS
Field (Reservoir) : HIGH ISLAND

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 7102239 | 6 | 2/ 9/68 | 100 | 9330 |
| 7102250 | 7 | 8/ 2/65 | 0 | 0 |
| 7102252 | 6 | 7/20/67 | 100 | 9952 |
| 7181373 | 6 | 8/ 2/65 | 100 | 10184 |
| 7181374 | 6 | 8/ 2/65 | 100 | 10144 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : CHAMBERS
Field (Reservoir) : LOST LAKE

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 7101017 | 6 | 0/ 0/ 0 | 0 | 1107 |
| 7131160 | 7 | 5/26/82 | 500 | 1540 |
| 7131166 | 4 | 12/12/84 | 0 | 1500 |
| 7131209 | 4 | 0/ 0/ 0 | 0 | 2800 |
| 7131434 | 3 | 8/ 4/89 | 500 | 1940 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : CHAMBERS
Field (Reservoir) : MOSS BLUFF

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 7181450 | 3 | 9/29/69 | 700 | 5565 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : CHAMBERS
Field (Reservoir) : OYSTER BAYOU
Field (Reservoir) : OYSTER BAYOU (FB-3A FRIO 2)
Field (Reservoir) : OYSTER BAYOU (FRIO 2)
Field (Reservoir) : OYSTER BAYOU (FRIO 2 FB-3)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 7102333 | 3 | 2/ 4/63 | 1250 | 1400 |
| 7102292 | 6 | 7/ 5/50 | 350 | 8424 |
| 7181024 | 3 | 2/ 4/63 | 1250 | 1400 |
| 7102052 | 3 | 7/31/50 | 400 | 8349 |
| 7130247 | 4 | 12/21/73 | 400 | 1400 |
| 7102053 | 6 | 7/31/50 | 350 | 8294 |
| 7181029 | 4 | 7/31/50 | 350 | 8316 |
| 7102050 | 7 | 7/31/50 | 0 | 8392 |
| 7102340 | 3 | 7/31/50 | 350 | 8387 |
| 7102051 | 4 | 7/31/50 | 350 | 8403 |
| 7102321 | 3 | 7/31/50 | 400 | 8318 |
| 7102316 | 7 | 7/31/50 | 350 | 8410 |
| 7102340 | 3 | 9/30/76 | 400 | 8260 |
| 7102296 | 6 | 4/25/74 | 0 | 0 |
| 7102318 | 6 | 7/31/50 | 350 | 8410 |
| 7130497 | 3 | 7/31/50 | 400 | 8354 |
| 7130800 | 6 | 7/31/50 | 350 | 8390 |
| 7102322 | 3 | 4/ 5/78 | 350 | 8288 |
| 7181062 | 3 | 7/31/50 | 350 | 8250 |
| 7181065 | 4 | 7/31/70 | 350 | 8410 |
| 7102311 | 3 | 10/14/70 | 400 | 8290 |
| 7132017 | 4 | 7/ 5/50 | 350 | 8293 |
| 7102306 | 4 | 2/14/78 | 350 | 8225 |
| 7102310 | 4 | 7/31/50 | 350 | 8244 |
| 7102319 | 7 | 1/ 7/81 | 350 | 8292 |
| 7102317 | 3 | 6/26/64 | 350 | 8328 |
| 7102302 | 6 | 8/12/82 | 0 | 8311 |
| 7102327 | 6 | 4/15/83 | 0 | 0 |
| 7102328 | 6 | 0/ 0/ 0 | 0 | 8190 |
| 7131089 | 4 | 9/ 8/81 | 350 | 8390 |
| 7102338 | 3 | 2/10/84 | 0 | 8385 |
| 7130379 | 3 | 12/17/85 | 0 | 8343 |
| 7102328 | 6 | 1/31/78 | 0 | 0 |
| 7102341 | 5 | 1/ 7/87 | 400 | 8330 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : CHAMBERS
Field (Reservoir) : STOWELL
Field (Reservoir) : STOWELL (DISCORBIS)
Field (Reservoir) : STOWELL (MIOCENE 6250)
Field (Reservoir) : STOWELL (6180)
Field (Reservoir) : STOWELL (5950)
Field (Reservoir) : STOWELL (MIOCENE 5650)
Field (Reservoir) : STOWELL (CRAWFORD U-1)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 7101834 | 8 | 4/ 7/66 | 0 | 1177 |
| 7120118 | 3 | 10/10/67 | 400 | 1790 |
| 7181650 | 7 | 4/26/63 | 0 | 1125 |
| 7181475 | 7 | 9/26/72 | 0 | 2260 |
| 7181592 | 4 | 10/ 1/68 | 6400 | 1312 |
| 7101830 | 8 | 10/ 2/74 | 450 | 3456 |
| 7103180 | 4 | 1/18/80 | 0 | 2000 |
| 7130061 | 4 | 7/28/89 | 350 | 4800 |
| 7101823 | 2 | 5/20/92 | 400 | 1600 |
| 7100000 | 0 | 8/ 9/93 | 600 | 2890 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : HARDIN
Field (Reservoir) : ARRIOLA*
Field (Reservoir) : ARRIOLA (VICKSBURG 7050)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 19903075 | 7 | 2/26/69 | 0 | 2830 |
| 19903053 | 8 | 0/ 0/ 0 | 1700 | 2730 |
| 19903610 | 3 | 8/14/74 | 0 | 0 |
| 19903065 | 7 | 5/ 4/77 | 0 | 2695 |
| 19930436 | 3 | 0/ 0/ 0 | 1700 | 2812 |
| 19930435 | 3 | 3/23/82 | 1700 | 2638 |
| 19931708 | 3 | 4/ 6/87 | 1650 | 2610 |
| 19931856 | 4 | 0/ 0/ 0 | 1700 | 7190 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : HARDIN
Field (Reservoir) : BATSON NEW

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 19903352 | 8 | 2/10/72 | 0 | 3000 |
| 19903414 | 3 | 10/ 2/67 | 1400 | 3290 |
| 19931915 | 6 | 11/ 6/67 | 0 | 2955 |
| 19901029 | 7 | 7/23/64 | 0 | 0 |
| 19931264 | 3 | 0/ 0/ 0 | 1300 | 2630 |
| 19901037 | 7 | 3/ 1/68 | 0 | 0 |
| 19930176 | 4 | 0/ 0/ 0 | 0 | 3300 |
| 19930197 | 4 | 0/ 0/ 0 | 0 | 3300 |
| 19901032 | 6 | 5/18/76 | 1300 | 2684 |
| 19901040 | 6 | 0/ 0/ 0 | 1300 | 2920 |
| 19901196 | 6 | 0/ 0/ 0 | 1350 | 2260 |
| 19930666 | 6 | 5/18/76 | 1100 | 3119 |
| 19900000 | 7 | 5/18/76 | 1550 | 3815 |
| 19901026 | 8 | 5/18/76 | 1550 | 3191 |
| 19900000 | 8 | 0/ 0/ 0 | 0 | 3319 |
| 19931793 | 2 | 0/ 0/ 0 | 0 | 3600 |
| 19932178 | 7 | 0/ 0/ 0 | 0 | 2973 |
| 19931914 | 4 | 0/ 0/ 0 | 0 | 4100 |
| 19981659 | 3 | 0/ 0/ 0 | 0 | 3500 |
| 19930483 | 3 | 11/14/85 | 1250 | 2949 |
| 19900839 | 3 | 3/28/68 | 1400 | 3420 |
| 19903353 | 8 | 11/29/66 | 1500 | 2890 |
| 19932061 | 5 | 0/ 0/ 0 | 0 | 2984 |
| 19901104 | 6 | 12/ 9/63 | 1300 | 1825 |
| 19932153 | 3 | 8/15/89 | 1350 | 2150 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : HARDIN
Field (Reservoir) : BATSON OLD

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 19930689 | 3 | 2/ 1/77 | 250 | 1141 |
| 19930796 | 3 | 0/ 0/ 0 | 150 | 1200 |
| 19901451 | 3 | 7/13/78 | 250 | 1300 |
| 19901459 | 4 | 5/15/75 | 250 | 1150 |
| 19931284 | 3 | 0/ 0/ 0 | 300 | 1160 |
| 19980267 | 3 | 0/ 0/ 0 | 650 | 1156 |
| 19920178 | 8 | 5/23/68 | 0 | 1200 |
| 19931931 | 3 | 9/ 2/83 | 200 | 1140 |
| 19932223 | 3 | 0/ 0/ 0 | 0 | 1400 |
| 19931474 | 6 | 0/ 0/ 0 | 0 | 1200 |
| 19931670 | 3 | 1/30/85 | 250 | 1156 |
| 19931863 | 4 | 0/ 0/ 0 | 0 | 1200 |
| 19981780 | 7 | 4/ 3/67 | 1900 | 920 |
| 19901157 | 3 | 3/ 3/92 | 375 | 1030 |
| 19932638 | 3 | 10/27/94 | 275 | 238 |
| 19932677 | 3 | 10/27/94 | 200 | 250 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : HARDIN
Field (Reservoir) : SARATOGA
Field (Reservoir) : SARATOGA (EY)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 19900723 | 3 | 9/28/64 | 1700 | 4100 |
| 19901620 | 6 | 6/ 9/76 | 0 | 4476 |
| 19930119 | 8 | 3/22/71 | 600 | 1690 |
| 19901773 | 3 | 11/28/66 | 720 | 1635 |
| 19980450 | 3 | 7/ 7/77 | 950 | 1842 |
| 19920098 | 7 | 0/ 0/ 0 | 1100 | 1495 |
| 19900691 | 8 | 8/ 7/64 | 2000 | 6833 |
| 19901902 | 7 | 12/ 1/70 | 1100 | 880 |
| 19930409 | 6 | 11/20/75 | 1100 | 882 |
| 19901884 | 7 | 12/ 1/70 | 1100 | 883 |
| 19930033 | 7 | 5/25/73 | 500 | 825 |
| 19930160 | 7 | 12/ 1/70 | 1100 | 1000 |
| 19930223 | 6 | 12/ 1/70 | 1100 | 1071 |
| 19930227 | 7 | 12/ 1/70 | 1100 | 629 |
| 19930323 | 6 | 12/ 1/70 | 0 | 0 |
| 19931191 | 6 | 0/ 0/ 0 | 0 | 0 |
| 19930675 | 4 | 7/ 2/81 | 1100 | 712 |
| 19931600 | 6 | 5/19/81 | 1100 | 940 |
| 19931517 | 6 | 7/24/81 | 1100 | 813 |
| 19930322 | 4 | 12/ 1/70 | 0 | 0 |
| 19931695 | 3 | 3/16/82 | 900 | 1439 |
| 19930843 | 6 | 3/22/82 | 1100 | 957 |
| 19930116 | 7 | 0/ 0/ 0 | 0 | 1724 |
| 19931603 | 3 | 0/ 0/ 0 | 0 | 4000 |
| 19901936 | 3 | 5/31/83 | 0 | 1440 |
| 19931531 | 3 | 0/ 0/ 0 | 0 | 1632 |
| 19932352 | 3 | 0/ 0/ 0 | 0 | 1712 |
| 19931547 | 6 | 0/ 0/ 0 | 0 | 1300 |
| 19932316 | 6 | 0/ 0/ 0 | 0 | 1000 |
| 19932400 | 4 | 8/13/86 | 0 | 350 |
| 19932411 | 4 | 8/13/86 | 1100 | 480 |
| 19932397 | 4 | 8/13/86 | 0 | 350 |
| 19932409 | 6 | 8/13/86 | 0 | 350 |
| 19932404 | 6 | 8/13/86 | 0 | 350 |
| 19932301 | 6 | 2/13/87 | 1000 | 790 |
| 19932398 | 4 | 3/27/87 | 1100 | 480 |
| 19931629 | 3 | 6/ 3/87 | 1025 | 1684 |
| 19901881 | 8 | 8/ 6/80 | 1100 | 1017 |
| 19930028 | 6 | 1/16/73 | 600 | 1000 |
| 19930076 | 6 | 4/12/73 | 1100 | 872 |
| 19932486 | 5 | 5/ 4/89 | 950 | 1385 |
| 19932555 | 4 | 5/30/90 | 1200 | 501 |
| 19932560 | 4 | 5/30/90 | 1200 | 502 |
| 19932601 | 4 | 4/ 2/91 | 650 | 594 |
| 19932605 | 4 | 4/ 2/91 | 750 | 749 |
| 19932603 | 5 | 4/ 2/91 | 750 | 760 |
| 19932606 | 5 | 4/ 2/91 | 750 | 530 |
| 19932597 | 4 | 4/ 2/91 | 750 | 530 |
| 19932595 | 4 | 4/ 2/91 | 750 | 524 |
| 19932608 | 4 | 5/ 1/91 | 600 | 600 |

| | | | | |
|---|---|---|---|---|
| 19932598 | 1 | 5/ 1/91 | 550 | 1400 |
| 19931494 | 2 | 5/21/91 | 2250 | 5800 |
| 19932410 | 5 | 12/ 1/70 | 500 | 535 |
| 19932214 | 4 | 9/23/92 | 2125 | 2315 |
| 19932593 | 0 | 11/ 3/93 | 1100 | 608 |
| 19931896 | 3 | 11/ 8/93 | 550 | 834 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : HARDIN
Field (Reservoir) : SARATOGA WEST

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 19930780 | 6 | 9/18/79 | 1950 | 2392 |
| 19901659 | 7 | 6/ 5/68 | 0 | 7106 |
| 19901732 | 7 | 6/ 6/66 | 0 | 2850 |
| 19901570 | 8 | 8/15/58 | 0 | 3570 |
| 19980997 | 3 | 6/30/66 | 2100 | 3400 |
| 19901591 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19901620 | 4 | 0/ 0/ 0 | 2200 | 4476 |
| 19901655 | 3 | 7/28/80 | 550 | 2373 |
| 19981455 | 4 | 1/14/77 | 2250 | 7037 |
| 19930685 | 4 | 3/26/86 | 0 | 3640 |
| 19930702 | 2 | 0/ 0/ 0 | 0 | 3560 |
| 19930781 | 2 | 0/ 0/ 0 | 2050 | 3510 |
| 19932235 | 3 | 5/19/93 | 2150 | 2930 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : HARDIN
Field (Reservoir) : SOUR LAKE

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 19981036 | 8 | 1/24/67 | 0 | 1385 |
| 19930185 | 6 | 9/30/70 | 600 | 1462 |
| 19903298 | 8 | 0/ 0/ 0 | 0 | 2646 |
| 19902288 | 8 | 0/ 0/ 0 | 0 | 1422 |
| 19930439 | 7 | 0/ 0/ 0 | 650 | 954 |
| 19930503 | 4 | 0/ 0/ 0 | 500 | 1193 |
| 19902149 | 6 | 6/18/63 | 600 | 3039 |
| 19902587 | 7 | 2/12/68 | 0 | 1220 |
| 19902749 | 5 | 11/ 3/78 | 1600 | 2142 |
| 19903175 | 3 | 4/ 7/77 | 1450 | 2414 |
| 19902483 | 8 | 0/ 0/ 0 | 1000 | 1370 |
| 19902485 | 3 | 4/19/56 | 0 | 1415 |
| 19902390 | 3 | 1/ 8/64 | 1200 | 3050 |
| 19902630 | 3 | 6/11/71 | 0 | 0 |
| 19930412 | 3 | 10/ 6/72 | 600 | 1526 |
| 19980769 | 3 | 7/22/68 | 1300 | 4170 |
| 19902134 | 3 | 5/24/66 | 1800 | 2100 |
| 19902458 | 6 | 0/ 0/ 0 | 0 | 1810 |
| 19902988 | 8 | 2/ 4/52 | 0 | 964 |
| 19902969 | 8 | 10/31/71 | 0 | 0 |
| 19902971 | 2 | 6/ 2/77 | 900 | 400 |
| 19902974 | 7 | 0/ 0/ 0 | 350 | 400 |
| 19902979 | 7 | 3/16/72 | 0 | 0 |
| 19903229 | 7 | 3/16/72 | 0 | 0 |
| 19930083 | 7 | 6/ 2/77 | 0 | 0 |
| 19930128 | 7 | 6/12/77 | 0 | 0 |
| 19930349 | 7 | 1/29/76 | 0 | 400 |
| 19930365 | 7 | 3/ 6/74 | 0 | 0 |
| 19902990 | 3 | 0/ 0/ 0 | 0 | 0 |
| 19902991 | 3 | 0/ 0/ 0 | 0 | 0 |
| 19902992 | 3 | 0/ 0/ 0 | 0 | 0 |
| 19902993 | 4 | 0/ 0/ 0 | 0 | 0 |
| 19902927 | 3 | 1/20/81 | 1300 | 3690 |
| 19930269 | 7 | 0/ 0/ 0 | 0 | 4630 |
| 19902619 | 3 | 0/ 0/ 0 | 1060 | 1820 |
| 19903489 | 3 | 3/ 9/81 | 900 | 1882 |
| 19930270 | 3 | 0/ 0/ 0 | 0 | 3700 |
| 19903009 | 8 | 3/ 9/81 | 0 | 800 |
| 19930761 | 3 | 1/ 9/81 | 1450 | 3820 |
| 19902916 | 3 | 9/ 3/81 | 1350 | 3700 |
| 19931229 | 7 | 2/25/82 | 350 | 480 |
| 19931274 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19931275 | 2 | 0/ 0/ 0 | 0 | 0 |
| 19931276 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19931466 | 7 | 2/22/82 | 325 | 987 |
| 19981434 | 3 | 3/26/81 | 500 | 1450 |
| 19931627 | 7 | 0/ 0/ 0 | 0 | 3500 |
| 19930728 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19980748 | 7 | 0/ 0/ 0 | 0 | 1700 |
| 19902989 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19902960 | 8 | 4/ 8/82 | 0 | 0 |

| | | | | |
|---|---|---|---|---|
| 19930063 | 7 | 0/ 0/ 0 | 925 | 400 |
| 19930606 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19930712 | 2 | 0/ 0/ 0 | 0 | 0 |
| 19931227 | 6 | 4/ 8/82 | 0 | 0 |
| 19930609 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19931313 | 6 | 0/ 0/ 0 | 0 | 0 |
| 19931653 | 8 | 0/ 0/ 0 | 0 | 0 |
| 19902490 | 8 | 0/ 0/ 0 | 0 | 1730 |
| 19931754 | 2 | 4/ 7/83 | 600 | 400 |
| 19931745 | 2 | 4/ 7/83 | 600 | 400 |
| 19931746 | 2 | 4/ 7/83 | 600 | 1583 |
| 19931747 | 2 | 4/ 7/83 | 600 | 400 |
| 19931765 | 2 | 4/ 7/83 | 600 | 400 |
| 19931764 | 2 | 4/ 7/83 | 600 | 400 |
| 19931797 | 2 | 4/ 7/83 | 600 | 400 |
| 19931815 | 2 | 4/ 7/83 | 600 | 400 |
| 19980780 | 6 | 4/ 8/82 | 0 | 0 |
| 19980781 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19902908 | 8 | 0/ 0/ 0 | 0 | 0 |
| 19902909 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19902910 | 6 | 4/ 8/82 | 0 | 0 |
| 19902911 | 2 | 0/ 0/ 0 | 0 | 0 |
| 19902923 | 8 | 0/ 0/ 0 | 0 | 0 |
| 19902929 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19902930 | 8 | 0/ 0/ 0 | 0 | 0 |
| 19902962 | 8 | 4/ 8/82 | 0 | 0 |
| 19902966 | 8 | 4/ 8/82 | 0 | 0 |
| 19902967 | 6 | 4/ 8/82 | 0 | 0 |
| 19902972 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19902980 | 6 | 4/ 8/82 | 0 | 0 |
| 19902980 | 6 | 4/ 8/82 | 0 | 0 |
| 19903042 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19902982 | 6 | 4/ 8/82 | 0 | 0 |
| 19902982 | 6 | 4/ 8/82 | 0 | 0 |
| 19902984 | 6 | 4/ 8/82 | 0 | 0 |
| 19903295 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19903365 | 2 | 0/ 0/ 0 | 0 | 465 |
| 19903377 | 6 | 4/ 8/82 | 0 | 0 |
| 19903379 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19930551 | 6 | 4/ 8/82 | 0 | 0 |
| 19903528 | 8 | 4/ 8/82 | 0 | 0 |
| 19903592 | 6 | 4/ 8/82 | 0 | 0 |
| 19930026 | 6 | 4/ 8/82 | 0 | 0 |
| 19930045 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19930080 | 6 | 4/ 8/82 | 0 | 0 |
| 19930081 | 6 | 4/ 8/82 | 0 | 0 |
| 19930089 | 6 | 4/ 8/82 | 0 | 0 |
| 19930087 | 2 | 4/ 8/82 | 0 | 0 |
| 19930088 | 6 | 4/ 8/82 | 0 | 0 |
| 19930106 | 6 | 4/ 8/82 | 0 | 0 |
| 19930127 | 6 | 4/ 8/82 | 0 | 0 |
| 19930125 | 8 | 0/ 0/ 0 | 0 | 0 |
| 19930140 | 6 | 4/ 8/82 | 0 | 0 |
| 19930144 | 6 | 4/ 8/82 | 0 | 0 |
| 19930143 | 6 | 4/ 8/82 | 0 | 0 |
| 19930152 | 6 | 4/ 8/82 | 0 | 0 |
| 19931169 | 7 | 0/ 0/ 0 | 0 | 1004 |
| 19930171 | 6 | 4/ 8/82 | 0 | 0 |
| 19930173 | 6 | 4/ 8/82 | 0 | 0 |
| 19930183 | 6 | 4/ 8/82 | 0 | 0 |

| | | | | |
|---|---|---|---|---|
| 19930184 | 6 | 4/ 8/82 | 0 | 0 |
| 19930207 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19930244 | 6 | 4/ 8/82 | 0 | 0 |
| 19930242 | 2 | 0/ 0/ 0 | 0 | 0 |
| 19930608 | 6 | 4/ 8/82 | 0 | 0 |
| 19930607 | 6 | 4/ 8/82 | 0 | 0 |
| 19930613 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19930610 | 6 | 4/ 8/82 | 0 | 0 |
| 19930603 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19930602 | 6 | 4/ 8/82 | 0 | 0 |
| 19930600 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19930599 | 6 | 4/ 8/82 | 0 | 0 |
| 19930598 | 6 | 4/ 8/82 | 0 | 0 |
| 19930597 | 6 | 4/ 8/82 | 0 | 0 |
| 19930625 | 6 | 4/ 8/82 | 0 | 0 |
| 19930626 | 6 | 4/ 8/82 | 0 | 0 |
| 19930629 | 7 | 4/ 8/82 | 0 | 0 |
| 19930630 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19930636 | 6 | 4/ 8/82 | 0 | 0 |
| 19930634 | 6 | 4/ 8/82 | 0 | 0 |
| 19930633 | 6 | 4/ 8/82 | 0 | 0 |
| 19930635 | 7 | 0/ 0/ 0 | 0 | 1082 |
| 19930631 | 6 | 4/ 8/82 | 0 | 0 |
| 19930637 | 6 | 4/ 8/82 | 0 | 0 |
| 19930638 | 6 | 4/ 8/82 | 0 | 0 |
| 19930713 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19930714 | 6 | 4/ 8/82 | 0 | 0 |
| 19930717 | 6 | 4/ 8/82 | 0 | 0 |
| 19930726 | 6 | 4/ 8/82 | 0 | 0 |
| 19930727 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19930730 | 6 | 4/ 8/82 | 0 | 0 |
| 19930748 | 6 | 4/ 8/82 | 0 | 0 |
| 19930747 | 6 | 4/ 8/82 | 0 | 0 |
| 19930746 | 6 | 4/ 8/82 | 0 | 0 |
| 19930755 | 6 | 4/ 8/82 | 0 | 0 |
| 19931217 | 6 | 4/ 8/82 | 0 | 0 |
| 19931228 | 6 | 4/ 8/82 | 0 | 0 |
| 19931241 | 6 | 4/ 8/82 | 0 | 0 |
| 19931243 | 6 | 4/ 8/82 | 0 | 0 |
| 19931272 | 6 | 4/ 8/82 | 0 | 0 |
| 19931273 | 6 | 4/ 8/82 | 0 | 0 |
| 19931277 | 6 | 4/ 8/82 | 0 | 0 |
| 19931317 | 6 | 4/ 8/82 | 0 | 0 |
| 19931314 | 6 | 4/ 8/82 | 0 | 0 |
| 19931315 | 6 | 4/ 8/82 | 0 | 0 |
| 19931464 | 6 | 4/ 8/82 | 0 | 0 |
| 19931465 | 6 | 4/ 8/82 | 0 | 0 |
| 19931491 | 6 | 4/ 8/82 | 0 | 0 |
| 19930558 | 6 | 4/ 8/82 | 0 | 0 |
| 19930601 | 6 | 4/ 8/82 | 0 | 0 |
| 19980783 | 8 | 5/ 3/82 | 600 | 400 |
| 19902900 | 8 | 5/ 3/82 | 600 | 400 |
| 19902901 | 6 | 5/ 3/82 | 316 | 400 |
| 19902902 | 6 | 5/ 3/82 | 316 | 400 |
| 19902903 | 6 | 5/ 3/82 | 900 | 400 |
| 19902904 | 6 | 5/ 3/82 | 316 | 400 |
| 19902906 | 6 | 5/ 3/82 | 600 | 400 |
| 19902907 | 8 | 0/ 0/ 0 | 316 | 400 |
| 19902912 | 6 | 5/ 3/82 | 900 | 400 |
| 19902913 | 6 | 5/ 3/82 | 900 | 400 |

| | | | | |
|---|---|---|---|---|
| 19902933 | 8 | 5/ 3/82 | 350 | 400 |
| 19902961 | 8 | 5/ 3/82 | 950 | 400 |
| 19902963 | 6 | 5/ 3/82 | 950 | 400 |
| 19902964 | 6 | 5/ 3/82 | 316 | 400 |
| 19902965 | 8 | 5/ 3/82 | 950 | 400 |
| 19903453 | 4 | 0/ 0/ 0 | 0 | 1900 |
| 19902968 | 6 | 5/ 3/82 | 316 | 400 |
| 19902970 | 8 | 5/ 3/82 | 950 | 400 |
| 19902973 | 8 | 5/ 3/82 | 350 | 400 |
| 19902975 | 8 | 5/ 3/82 | 316 | 400 |
| 19902976 | 6 | 5/ 3/82 | 350 | 400 |
| 19902983 | 6 | 5/ 3/82 | 900 | 400 |
| 19902983 | 6 | 5/ 3/82 | 950 | 400 |
| 19903180 | 6 | 5/ 3/82 | 350 | 400 |
| 19903180 | 6 | 5/ 3/82 | 800 | 400 |
| 19930546 | 6 | 5/ 3/82 | 925 | 400 |
| 19930547 | 2 | 3/ 3/82 | 925 | 1500 |
| 19903251 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19903338 | 6 | 5/ 3/82 | 350 | 400 |
| 19903343 | 6 | 5/ 3/82 | 950 | 400 |
| 19903344 | 6 | 5/ 3/82 | 925 | 400 |
| 19903349 | 6 | 5/ 3/82 | 350 | 400 |
| 19903341 | 6 | 5/ 3/82 | 350 | 400 |
| 19903362 | 6 | 5/ 3/82 | 350 | 400 |
| 19903376 | 6 | 5/ 3/82 | 950 | 400 |
| 19903378 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19903471 | 6 | 5/ 3/82 | 200 | 400 |
| 19903535 | 8 | 5/ 3/82 | 350 | 400 |
| 19903432 | 6 | 5/ 3/83 | 350 | 400 |
| 19930553 | 6 | 5/ 3/82 | 925 | 400 |
| 19903593 | 6 | 5/ 3/82 | 350 | 400 |
| 19930025 | 6 | 5/ 3/82 | 925 | 400 |
| 19930023 | 6 | 5/ 3/82 | 350 | 400 |
| 19930044 | 8 | 0/ 0/ 0 | 350 | 400 |
| 19930043 | 6 | 5/ 3/82 | 350 | 400 |
| 19930042 | 6 | 5/ 3/82 | 350 | 400 |
| 19930052 | 6 | 5/ 3/82 | 350 | 400 |
| 19930050 | 6 | 5/ 3/82 | 350 | 400 |
| 19930049 | 7 | 0/ 0/ 0 | 0 | 0 |
| 19930048 | 8 | 0/ 0/ 0 | 350 | 400 |
| 19930058 | 6 | 5/ 3/82 | 350 | 400 |
| 19930105 | 6 | 5/ 3/82 | 350 | 400 |
| 19930121 | 2 | 3/ 3/82 | 600 | 1190 |
| 19930126 | 6 | 5/ 3/82 | 925 | 400 |
| 19930139 | 6 | 5/ 3/82 | 925 | 400 |
| 19930145 | 8 | 0/ 0/ 0 | 925 | 400 |
| 19930153 | 6 | 5/ 3/82 | 925 | 400 |
| 19930157 | 6 | 0/ 0/ 0 | 350 | 400 |
| 19930156 | 6 | 5/ 3/82 | 925 | 400 |
| 19930187 | 8 | 0/ 0/ 0 | 925 | 400 |
| 19930189 | 2 | 0/ 0/ 0 | 925 | 400 |
| 19930206 | 6 | 5/ 3/82 | 925 | 400 |
| 19930219 | 8 | 5/ 3/82 | 925 | 400 |
| 19930238 | 6 | 5/ 3/82 | 950 | 400 |
| 19930239 | 6 | 5/ 3/82 | 350 | 400 |
| 19930246 | 6 | 5/ 8/82 | 925 | 400 |
| 19930245 | 6 | 5/ 3/82 | 350 | 400 |
| 19930549 | 6 | 5/ 3/82 | 925 | 400 |
| 19930357 | 6 | 5/ 3/82 | 350 | 400 |
| 19930367 | 6 | 5/ 3/82 | 925 | 400 |

| | | | | |
|---|---|---|---|---|
| 19930366 | 2 | 0/ 0/ 0 | 350 | 400 |
| 19930533 | 6 | 5/ 3/82 | 925 | 400 |
| 19930532 | 6 | 5/ 3/82 | 350 | 400 |
| 19930535 | 6 | 5/ 3/82 | 600 | 400 |
| 19930534 | 6 | 5/ 3/82 | 925 | 400 |
| 19930552 | 7 | 0/ 0/ 0 | 925 | 400 |
| 19930556 | 6 | 5/ 3/82 | 925 | 400 |
| 19930037 | 6 | 0/ 0/ 0 | 0 | 0 |
| 19930576 | 6 | 5/ 3/82 | 600 | 400 |
| 19930575 | 2 | 0/ 0/ 0 | 925 | 400 |
| 19930574 | 7 | 0/ 0/ 0 | 925 | 400 |
| 19930573 | 6 | 5/ 3/82 | 925 | 400 |
| 19930572 | 6 | 5/ 3/82 | 925 | 400 |
| 19930582 | 6 | 5/ 3/82 | 925 | 400 |
| 19930581 | 6 | 5/ 3/82 | 925 | 400 |
| 19930580 | 6 | 5/ 3/82 | 925 | 400 |
| 19930579 | 6 | 5/ 3/82 | 925 | 400 |
| 19930578 | 6 | 5/ 3/82 | 925 | 400 |
| 19930710 | 2 | 0/ 0/ 0 | 925 | 400 |
| 19930711 | 6 | 5/ 3/82 | 925 | 400 |
| 19930740 | 2 | 0/ 0/ 0 | 850 | 400 |
| 19930741 | 6 | 5/ 3/82 | 925 | 400 |
| 19930744 | 6 | 0/ 0/ 0 | 0 | 0 |
| 19930749 | 6 | 5/ 3/82 | 925 | 400 |
| 19930753 | 7 | 0/ 0/ 0 | 925 | 400 |
| 19930752 | 6 | 5/ 3/82 | 925 | 400 |
| 19930769 | 7 | 0/ 0/ 0 | 900 | 400 |
| 19931216 | 6 | 5/ 3/82 | 600 | 400 |
| 19931219 | 7 | 0/ 0/ 0 | 925 | 400 |
| 19931218 | 6 | 5/ 3/82 | 925 | 400 |
| 19903257 | 6 | 5/ 3/82 | 900 | 400 |
| 19931242 | 6 | 5/ 3/82 | 925 | 400 |
| 19903166 | 8 | 0/ 0/ 0 | 0 | 1510 |
| 19980753 | 7 | 3/17/67 | 1900 | 2142 |
| 19903430 | 3 | 0/ 0/ 0 | 0 | 1598 |
| 19930719 | 3 | 2/26/82 | 1350 | 3800 |
| 19931654 | 2 | 4/ 8/82 | 0 | 0 |
| 19931753 | 6 | 4/ 8/82 | 0 | 0 |
| 19980682 | 7 | 0/ 0/ 0 | 1050 | 1811 |
| 19902919 | 3 | 0/ 0/ 0 | 0 | 3740 |
| 19930736 | 3 | 9/29/83 | 1500 | 3490 |
| 19902128 | 7 | 0/ 0/ 0 | 0 | 5300 |
| 19900000 | 7 | 0/ 0/ 0 | 0 | 2500 |
| 19931651 | 2 | 4/ 8/82 | 0 | 0 |
| 19930353 | 8 | 4/ 8/82 | 0 | 0 |
| 19931868 | 6 | 3/ 9/84 | 0 | 2015 |
| 19931917 | 6 | 3/ 9/84 | 0 | 2116 |
| 19931886 | 6 | 3/ 9/84 | 0 | 540 |
| 19932058 | 2 | 0/ 0/ 0 | 0 | 1380 |
| 19932055 | 6 | 3/ 9/84 | 0 | 1056 |
| 19932065 | 8 | 3/ 9/84 | 0 | 999 |
| 19932064 | 6 | 3/ 9/84 | 0 | 1274 |
| 19932086 | 6 | 3/ 9/84 | 0 | 512 |
| 19932089 | 2 | 4/23/84 | 600 | 400 |
| 19932087 | 2 | 4/23/84 | 600 | 400 |
| 19902300 | 3 | 5/ 1/84 | 500 | 1155 |
| 19981784 | 4 | 8/ 1/84 | 0 | 2722 |
| 19932199 | 7 | 0/ 0/ 0 | 0 | 400 |
| 19932198 | 2 | 0/ 0/ 0 | 600 | 400 |
| 19932196 | 2 | 0/ 0/ 0 | 600 | 400 |

| | | | | |
|---|---|---|---|---|
| 19932202 | 6 | 0/ 0/ 0 | 0 | 400 |
| 19932201 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19932206 | 2 | 0/ 0/ 0 | 600 | 400 |
| 19932204 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19932203 | 6 | 0/ 0/ 0 | 0 | 400 |
| 19932207 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19932209 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19932208 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19932254 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19932194 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19932200 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19932195 | 7 | 0/ 0/ 0 | 600 | 400 |
| 19932205 | 2 | 0/ 0/ 0 | 600 | 400 |
| 19930335 | 4 | 7/ 9/85 | 1500 | 3411 |
| 19931649 | 6 | 4/ 8/82 | 0 | 400 |
| 19930669 | 3 | 7/18/85 | 1500 | 3500 |
| 19902981 | 3 | 7/18/85 | 1500 | 3734 |
| 19930336 | 8 | 7/22/85 | 1500 | 3588 |
| 19930670 | 3 | 7/28/85 | 1500 | 3546 |
| 19932288 | 2 | 0/ 0/ 0 | 925 | 400 |
| 19932285 | 2 | 0/ 0/ 0 | 925 | 400 |
| 19932286 | 2 | 0/ 0/ 0 | 925 | 400 |
| 19932287 | 2 | 0/ 0/ 0 | 925 | 400 |
| 19932284 | 2 | 0/ 0/ 0 | 925 | 400 |
| 19981650 | 6 | 0/ 0/ 0 | 0 | 1628 |
| 19902937 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19902938 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19902940 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19902942 | 7 | 12/ 4/85 | 0 | 400 |
| 19902986 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19902987 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19902931 | 7 | 12/ 4/85 | 0 | 400 |
| 19902932 | 7 | 12/ 4/85 | 0 | 400 |
| 19902936 | 8 | 12/ 4/85 | 0 | 400 |
| 19903179 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903185 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903224 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903190 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903237 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903235 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903266 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903271 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903290 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903291 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903287 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903289 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903333 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903346 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903342 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903286 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903285 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903366 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903372 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903373 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903446 | 6 | 12/ 4/85 | 0 | 400 |
| 19903478 | 7 | 0/ 0/ 0 | 0 | 400 |
| 19903553 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930010 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930011 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903534 | 7 | 0/ 0/ 0 | 0 | 400 |

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| | | | | |
|---|---|---|---|---|
| 19930014 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930015 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930016 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930041 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930061 | 2 | 12/ 4/85 | 0 | 400 |
| 19930079 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930091 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930107 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930124 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930155 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930204 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930221 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930217 | 7 | 0/ 0/ 0 | 0 | 400 |
| 19930218 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930243 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930279 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930287 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930350 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930358 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930364 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930663 | 7 | 0/ 0/ 0 | 0 | 400 |
| 19900000 | 6 | 0/ 0/ 0 | 0 | 400 |
| 19930661 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19930659 | 7 | 0/ 0/ 0 | 0 | 400 |
| 19930660 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19931236 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19931316 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19931339 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19931489 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19931681 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903238 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19903288 | 2 | 0/ 0/ 0 | 0 | 400 |
| 19932361 | 7 | 0/ 0/ 0 | 0 | 1450 |
| 19980672 | 8 | 9/25/86 | 1000 | 3120 |
| 19903247 | 3 | 0/ 0/ 0 | 0 | 1380 |
| 19931810 | 3 | 0/ 0/ 0 | 0 | 2030 |
| 19981484 | 4 | 3/24/87 | 900 | 2221 |
| 19930616 | 3 | 10/18/74 | 0 | 1000 |
| 19930695 | 3 | 5/24/76 | 0 | 1000 |
| 19930694 | 3 | 5/24/76 | 0 | 1000 |
| 19930789 | 3 | 5/24/76 | 0 | 1000 |
| 19932427 | 6 | 0/ 0/ 0 | 1000 | 2800 |
| 19902716 | 2 | 1/26/88 | 1500 | 3472 |
| 19902920 | 2 | 0/ 0/ 0 | 155 | 3650 |
| 19902920 | 6 | 0/ 0/ 0 | 0 | 0 |
| 19930250 | 6 | 4/ 8/82 | 0 | 0 |
| 19930352 | 8 | 4/ 8/82 | 0 | 0 |
| 19930354 | 2 | 4/ 8/82 | 0 | 0 |
| 19930355 | 6 | 4/ 8/82 | 0 | 0 |
| 19930559 | 6 | 4/ 8/82 | 0 | 0 |
| 19931647 | 6 | 4/ 8/82 | 0 | 0 |
| 19931648 | 6 | 4/ 8/82 | 0 | 0 |
| 19931650 | 8 | 4/ 8/82 | 0 | 0 |
| 19931652 | 6 | 4/ 8/82 | 0 | 0 |
| 19931655 | 6 | 4/ 8/82 | 0 | 0 |
| 19932473 | 3 | 6/ 2/89 | 1350 | 3174 |
| 19932459 | 2 | 6/ 2/89 | 1350 | 3814 |
| 19932543 | 3 | 8/17/90 | 650 | 2290 |
| 19932390 | 3 | 11/15/91 | 1000 | 3390 |
| 19902586 | 3 | 10/ 5/81 | 900 | 1675 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : JACKSON
Field (Reservoir) : CORDELE (M-2)
Field (Reservoir) : CORDELE (2600)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 23900257 | 8 | 6/24/65 | 0 | 2760 |
| 23900239 | 7 | 8/26/74 | 0 | 0 |
| 23900200 | 7 | 10/ 1/73 | 0 | 0 |
| 23900259 | 7 | 0/ 0/ 0 | 0 | 2590 |
| 23900265 | 3 | 8/28/72 | 1450 | 2130 |
| 23900000 | 6 | 9/13/79 | 0 | 2130 |
| 23981452 | 3 | 0/ 0/ 0 | 1450 | 2184 |
| 23900170 | 8 | 0/ 0/ 0 | 0 | 1855 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : JACKSON
Field (Reservoir) : GANADO
Field (Reservoir) : GANADO (MARG. 2)
Field (Reservoir) : GANADO (3620)
Field (Reservoir) : GANADO (3700)
Field (Reservoir) : GANADO (4200)
Field (Reservoir) : GANADO (F- 3)
Field (Reservoir) : GANADO (F-3-H LOWER)
Field (Reservoir) : GANADO (F- 4-C SEG 2)
Field (Reservoir) : GANADO (3675)
Field (Reservoir) : GANADO (F- 4-A)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 23900831 | 7 | 0/ 0/ 0 | 0 | 3880 |
| 23900842 | 7 | 3/27/74 | 0 | 4315 |
| 23980725 | 4 | 0/ 0/ 0 | 0 | 3970 |
| 23901052 | 7 | 1/ 7/77 | 0 | 3610 |
| 23900738 | 7 | 0/ 0/ 0 | 0 | 3950 |
| 23900886 | 7 | 8/11/67 | 0 | 3880 |
| 23980988 | 3 | 5/18/82 | 0 | 3850 |
| 23900880 | 5 | 12/10/79 | 1700 | 6413 |
| 23930339 | 3 | 0/ 0/ 0 | 0 | 4320 |
| 23930051 | 6 | 0/ 0/ 0 | 0 | 0 |
| 23930654 | 6 | 0/ 0/ 0 | 0 | 4325 |
| 23930261 | 6 | 12/10/79 | 1700 | 6394 |
| 23981465 | 8 | 0/ 0/ 0 | 0 | 2170 |
| 23900879 | 3 | 11/30/70 | 0 | 4314 |
| 23900871 | 8 | 5/20/52 | 0 | 4330 |
| 23932350 | 0 | 3/31/88 | 1650 | 4430 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : JACKSON
Field (Reservoir) : GANADO WEST (CHARLES SAND)
Field (Reservoir) : GANADO WEST (4700 ZONE)
Field (Reservoir) : GANADO WEST (5100)
Field (Reservoir) : GANADO WEST (5440)
Field (Reservoir) : GANADO WEST
Field (Reservoir) : GANADO WEST (5300)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 23900603 | 4 | 0/ 0/ 0 | 1700 | 4119 |
| 23903804 | 6 | 11/15/72 | 0 | 4020 |
| 23900594 | 3 | 0/ 0/ 0 | 2150 | 3975 |
| 23981478 | 6 | 0/ 0/ 0 | 0 | 1885 |
| 23920161 | 4 | 3/20/67 | 2050 | 4040 |
| 23903447 | 7 | 0/ 0/ 0 | 0 | 2662 |
| 23903480 | 7 | 4/13/70 | 0 | 4810 |
| 23931536 | 3 | 9/24/80 | 1850 | 4050 |
| 23900605 | 4 | 0/ 0/ 0 | 0 | 4085 |
| 23903512 | 4 | 0/ 0/ 0 | 0 | 4777 |
| 23900563 | 7 | 0/ 0/ 0 | 0 | 3600 |
| 23932106 | 6 | 5/ 3/88 | 1725 | 4120 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : JACKSON
Field (Reservoir) : LA WARD NORTH
Field (Reservoir) : LA WARD NORTH (5100)
Field (Reservoir) : LA WARD NORTH (6550)
Field (Reservoir) : LA WARD NORTH (5500)
Field (Reservoir) : LA WARD NORTH (5530)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 23931424 | 8 | 12/ 6/79 | 1530 | 1602 |
| 23901222 | 3 | 6/10/77 | 1500 | 4395 |
| 23901224 | 3 | 4/18/67 | 0 | 4390 |
| 23901785 | 7 | 4/ 2/69 | 0 | 2240 |
| 23920284 | 8 | 8/11/67 | 0 | 2040 |
| 23901751 | 4 | 0/ 0/ 0 | 1500 | 4440 |
| 23900000 | 7 | 0/ 0/ 0 | 0 | 1602 |
| 23932130 | 3 | 1/30/85 | 925 | 1920 |
| 23981458 | 8 | 5/24/51 | 850 | 1400 |
| 23903827 | 6 | 0/ 0/ 0 | 0 | 3850 |
| 23903827 | 4 | 6/28/85 | 1500 | 3850 |
| 23901219 | 2 | 5/25/89 | 1525 | 2250 |
| 23901233 | 3 | 3/15/91 | 1575 | 4100 |
| 23932283 | 2 | 9/27/82 | 0 | 0 |
| 23901244 | 3 | 7/14/94 | 1575 | 4250 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : JACKSON
Field (Reservoir) : LOLITA (MARGINULINA ZONE)
Field (Reservoir) : LOLITA (MOPAC SAND)
Field (Reservoir) : LOLITA (WARD ZONE)
Field (Reservoir) : LOLITA (TONEY ZONE)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 23980993 | 4 | 9/14/72 | 1650 | 4502 |
| 23902139 | 8 | 0/ 0/ 0 | 0 | 1678 |
| 23902199 | 7 | 11/12/73 | 0 | 4425 |
| 23903672 | 8 | 11/22/72 | 1300 | 1980 |
| 23902053 | 7 | 11/16/64 | 0 | 4438 |
| 23902059 | 8 | 10/ 7/75 | 0 | 5384 |
| 23902244 | 8 | 12/ 8/75 | 0 | 2078 |
| 23902162 | 8 | 1/ 5/82 | 0 | 5380 |
| 23902125 | 8 | 2/20/76 | 0 | 2060 |
| 23902234 | 3 | 0/ 0/ 0 | 1300 | 2088 |
| 23900000 | 6 | 0/ 0/ 0 | 0 | 3900 |
| 23902273 | 3 | 10/29/74 | 1300 | 1767 |
| 23930124 | 4 | 0/ 0/ 0 | 1300 | 4330 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : BRAZORIA
Field (Reservoir) : BRYAN MOUND

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 3931253 | 8 | 0/ 0/ 0 | 0 | 4610 |
| 3931284 | 8 | 0/ 0/ 0 | 0 | 5710 |
| 3931259 | 8 | 0/ 0/ 0 | 0 | 5650 |
| 3931332 | 8 | 0/ 0/ 0 | 0 | 5885 |
| 3931260 | 8 | 0/ 0/ 0 | 0 | 5680 |
| 3931288 | 8 | 0/ 0/ 0 | 0 | 5742 |
| 3900000 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3900000 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931372 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931373 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3900000 | 4 | 0/ 0/ 0 | 0 | 0 |
| 3931383 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931385 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931388 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931387 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931421 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931390 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931398 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931402 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931391 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931393 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931368 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931361 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931376 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931379 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931404 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931405 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931329 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931410 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931413 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931814 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931816 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931818 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931820 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931371 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931397 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931345 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931399 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931400 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931403 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931363 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931392 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931380 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931328 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931394 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931375 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931411 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931815 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931817 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931819 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931821 | 3 | 0/ 0/ 0 | 0 | 0 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : JACKSON
Field (Reservoir) : MAURBRO
Field (Reservoir) : MAURBRO (MARGINULINA 5100)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 23932130 | 3 | 5/ 8/64 | 1600 | 2100 |
| 23901101 | 6 | 0/ 0/ 0 | 0 | 4350 |
| 23901281 | 8 | 3/ 3/72 | 1600 | 5172 |
| 23900000 | 6 | 0/ 0/ 0 | 0 | 2000 |
| 23980914 | 4 | 0/ 0/ 0 | 1550 | 2000 |
| 23901101 | 3 | 11/20/78 | 1550 | 3850 |
| 23932128 | 2 | 10/31/94 | 950 | 2000 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : JACKSON
Field (Reservoir) : STEWART
Field (Reservoir) : STEWART (6220)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 23900794 | 3 | 0/ 0/ 0 | 1650 | 4290 |
| 23900791 | 4 | 2/15/67 | 1750 | 4300 |
| 23900807 | 7 | 5/17/66 | 0 | 4400 |
| 23930485 | 4 | 0/ 0/ 0 | 1600 | 4290 |
| 23900796 | 4 | 12/ 1/76 | 0 | 4410 |
| 23980989 | 3 | 1/27/72 | 1750 | 4235 |
| 23903458 | 4 | 0/ 0/ 0 | 0 | 4215 |
| 23900000 | 6 | 0/ 0/ 0 | 0 | 4410 |
| 23931816 | 3 | 0/ 0/ 0 | 0 | 4100 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : JACKSON
Field (Reservoir) : WEST RANCH (GLASSCOCK)
Field (Reservoir) : WEST RANCH (GRETA)
Field (Reservoir) : WEST RANCH (OTHER ZONES)
Field (Reservoir) : WEST RANCH (WARD)
Field (Reservoir) : WEST RANCH (TONEY)
Field (Reservoir) : WEST RANCH (98-A)
Field (Reservoir) : WEST RANCH (41-A)
Field (Reservoir) : WEST RANCH (MARGINULINA 5000)
Field (Reservoir) : WEST RANCH (BENNVIEW)
Field (Reservoir) : WEST RANCH (FRIO 6200)
Field (Reservoir) : WEST RANCH (DIXON SAND)
Field (Reservoir) : WEST RANCH (3800)
Field (Reservoir) : WEST RANCH (MIOCENE -H-)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 23902309 | 4 | 2/22/72 | 1300 | 2676 |
| 23902363 | 6 | 0/ 0/ 0 | 0 | 0 |
| 23902388 | 7 | 0/ 0/ 0 | 0 | 0 |
| 23902394 | 6 | 0/ 0/ 0 | 0 | 0 |
| 23902416 | 7 | 0/ 0/ 0 | 0 | 0 |
| 23980586 | 7 | 0/ 0/ 0 | 0 | 0 |
| 23902482 | 6 | 11/ 3/66 | 0 | 0 |
| 23902515 | 7 | 0/ 0/ 0 | 0 | 0 |
| 23902700 | 7 | 0/ 0/ 0 | 0 | 0 |
| 23902797 | 6 | 1/30/75 | 0 | 4190 |
| 23902304 | 4 | 1/30/76 | 1450 | 4290 |
| 23902381 | 6 | 0/ 0/ 0 | 0 | 0 |
| 23902496 | 8 | 4/ 3/58 | 0 | 4310 |
| 23902542 | 7 | 5/ 6/74 | 0 | 4225 |
| 23902556 | 7 | 4/ 7/58 | 0 | 4320 |
| 23902582 | 7 | 10/ 8/70 | 0 | 4135 |
| 23902879 | 8 | 9/ 3/75 | 0 | 0 |
| 23902319 | 6 | 0/ 0/ 0 | 0 | 2350 |
| 23902541 | 3 | 2/12/70 | 0 | 5798 |
| 23902610 | 7 | 0/ 0/ 0 | 0 | 0 |
| 23902750 | 6 | 0/ 0/ 0 | 0 | 0 |
| 23902784 | 6 | 2/12/70 | 1400 | 5762 |
| 23903055 | 7 | 5/ 2/69 | 0 | 1885 |
| 23902422 | 6 | 0/ 0/ 0 | 0 | 4505 |
| 23902451 | 6 | 0/ 0/ 0 | 0 | 0 |
| 23902532 | 7 | 0/ 0/ 0 | 0 | 0 |
| 23902639 | 6 | 0/ 0/ 0 | 0 | 0 |
| 23902786 | 8 | 3/14/73 | 0 | 0 |
| 23902788 | 8 | 0/ 0/ 0 | 0 | 0 |
| 23902391 | 6 | 0/ 0/ 0 | 0 | 0 |
| 23902485 | 7 | 0/ 0/ 0 | 0 | 0 |
| 23902791 | 6 | 1/ 1/ 1 | 0 | 0 |
| 23902451 | 4 | 12/ 3/80 | 1500 | 4340 |
| 23931619 | 7 | 0/ 0/ 0 | 0 | 4200 |
| 23902513 | 4 | 0/ 0/ 0 | 0 | 4315 |
| 23903777 | 7 | 0/ 0/ 0 | 0 | 4350 |
| 23902372 | 3 | 11/14/80 | 1300 | 4320 |
| 23902375 | 8 | 12/ 3/80 | 1300 | 4170 |
| 23902786 | 8 | 12/ 3/80 | 0 | 4230 |

| | | | | |
|---|---|---|---|---|
| 23930061 | 3 | 2/ 6/81 | 1500 | 4322 |
| 23902675 | 4 | 10/ 7/82 | 0 | 4493 |
| 23902507 | 7 | 2/12/70 | 0 | 5168 |
| 23902449 | 4 | 4/11/83 | 0 | 4327 |
| 23902418 | 8 | 12/ 2/77 | 1500 | 5166 |
| 23930061 | 6 | 9/ 2/77 | 0 | 4375 |
| 23902756 | 7 | 0/ 0/ 0 | 0 | 0 |
| 23902372 | 6 | 0/ 0/ 0 | 0 | 4370 |
| 23902594 | 8 | 0/ 0/ 0 | 0 | 0 |
| 23981467 | 6 | 0/ 0/ 0 | 0 | 0 |
| 23902590 | 4 | 4/ 5/78 | 1475 | 5140 |
| 23980641 | 6 | 0/ 0/ 0 | 0 | 0 |
| 23980622 | 8 | 0/ 0/ 0 | 0 | 4120 |
| 23902797 | 7 | 0/ 0/ 0 | 0 | 3772 |
| 23902457 | 8 | 0/ 0/ 0 | 0 | 5042 |
| 23902654 | 8 | 4/11/83 | 0 | 0 |
| 23902563 | 8 | 11/30/82 | 0 | 4065 |
| 23902422 | 3 | 0/ 0/ 0 | 0 | 4330 |
| 23903823 | 5 | 2/11/80 | 1500 | 6120 |
| 23902500 | 6 | 0/ 0/ 0 | 0 | 5465 |
| 23902517 | 4 | 6/28/84 | 0 | 5470 |
| 23902562 | 7 | 9/17/87 | 1475 | 5135 |
| 23902712 | 3 | 9/17/87 | 0 | 5700 |
| 23902782 | 3 | 9/17/87 | 0 | 5730 |
| 23902430 | 4 | 10/16/84 | 0 | 5740 |
| 23902467 | 3 | 10/16/84 | 0 | 3782 |
| 23902499 | 3 | 9/17/87 | 0 | 5760 |
| 23903049 | 3 | 0/ 0/ 0 | 0 | 3700 |
| 23902588 | 3 | 1/23/85 | 0 | 5582 |
| 23902652 | 4 | 0/ 0/ 0 | 0 | 4310 |
| 23902601 | 3 | 11/ 6/85 | 1475 | 5160 |
| 23902374 | 4 | 11/ 6/85 | 0 | 5172 |
| 23902521 | 8 | 1/ 3/86 | 0 | 5177 |
| 23902598 | 3 | 12/17/85 | 0 | 5194 |
| 23902585 | 3 | 1/ 3/86 | 0 | 5160 |
| 23902531 | 8 | 6/27/86 | 0 | 5740 |
| 23902686 | 3 | 7/ 9/86 | 1500 | 4140 |
| 23902784 | 3 | 0/ 0/ 0 | 0 | 5568 |
| 23902424 | 8 | 2/ 6/67 | 1600 | 4998 |
| 23902596 | 8 | 12/16/86 | 0 | 5510 |
| 23902377 | 7 | 3/ 2/87 | 1500 | 5130 |
| 23902602 | 4 | 3/ 2/87 | 1500 | 5125 |
| 23902605 | 4 | 3/ 2/87 | 1500 | 5110 |
| 23902753 | 3 | 3/19/87 | 1500 | 3950 |
| 23902475 | 3 | 9/ 2/77 | 1500 | 5100 |
| 23900000 | 6 | 9/ 2/77 | 1500 | 5090 |
| 23902703 | 3 | 9/ 2/77 | 1500 | 5075 |
| 23902778 | 3 | 9/ 2/77 | 1500 | 5070 |
| 23902395 | 8 | 9/ 2/77 | 1500 | 5087 |
| 23902516 | 2 | 3/23/90 | 1500 | 5180 |
| 23902495 | 2 | 3/23/90 | 1500 | 5150 |
| 23930826 | 2 | 3/14/90 | 1500 | 4150 |
| 23902691 | 3 | 7/17/90 | 1500 | 3540 |
| 23902764 | 3 | 11/ 7/91 | 1400 | 4210 |
| 23932022 | 3 | 8/ 1/91 | 1550 | 5170 |
| 23902651 | 3 | 12/21/92 | 1450 | 4330 |
| 23902842 | 3 | 12/14/92 | 1450 | 4325 |
| 23902846 | 2 | 1/12/93 | 1400 | 4320 |
| 23902374 | 3 | 4/27/94 | 1500 | 4324 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : NUECES
Field (Reservoir) : AGUA DULCE
Field (Reservoir) : AGUA DULCE (DABNEY)
Field (Reservoir) : AGUA DULCE (PFLUGER LO.)
Field (Reservoir) : AGUA DULCE (AUSTIN LOWER)
Field (Reservoir) : AGUA DULCE (CONSOLIDATED FRIO)
Field (Reservoir) : AGUA DULCE (COMSTOCK -B-)
Field (Reservoir) : AGUA DULCE (COMSTOCK UPPER)
Field (Reservoir) : AGUA DULCE (2070)
Field (Reservoir) : AGUA DULCE (SPONBERG)
Field (Reservoir) : AGUA DULCE (6800 N.)
Field (Reservoir) : AGUA DULCE (7000)
Field (Reservoir) : AGUA DULCE (GERHARDT)
Field (Reservoir) : AGUA DULCE (6900 SALGE SAND)
Field (Reservoir) : AGUA DULCE (6240)
Field (Reservoir) : AGUA DULCE (STRAY 5100)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 35581469 | 3 | 3/ 1/71 | 1150 | 3814 |
| 35500722 | 3 | 8/14/67 | 1100 | 4918 |
| 35581686 | 4 | 11/15/79 | 1100 | 1785 |
| 35504943 | 8 | 3/29/78 | 0 | 2240 |
| 35504772 | 3 | 0/ 0/ 0 | 1150 | 3865 |
| 35531426 | 3 | 0/ 0/ 0 | 0 | 4217 |
| 35500366 | 7 | 2/20/68 | 0 | 3820 |
| 35504718 | 3 | 3/22/73 | 1200 | 3700 |
| 35504803 | 3 | 0/ 0/ 0 | 1150 | 4180 |
| 35500465 | 3 | 9/18/68 | 900 | 2670 |
| 35504798 | 4 | 6/22/64 | 1150 | 2685 |
| 35530506 | 7 | 1/30/74 | 0 | 0 |
| 35581760 | 8 | 3/17/67 | 0 | 0 |
| 35531575 | 6 | 0/ 0/ 0 | 0 | 4914 |
| 35530867 | 8 | 0/ 0/ 0 | 0 | 2100 |
| 35530686 | 4 | 6/ 5/85 | 1150 | 4038 |
| 35532454 | 3 | 0/ 0/ 0 | 0 | 5000 |
| 35500498 | 7 | 11/21/66 | 0 | 1490 |
| 35532572 | 3 | 7/27/87 | 1100 | 3800 |
| 35505713 | 3 | 12/14/88 | 1060 | 4145 |
| 35506232 | 3 | 10/ 8/92 | 1100 | 3850 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : NUECES
Field (Reservoir) : BALDWIN
Field (Reservoir) : BALDWIN (7400)
Field (Reservoir) : BALDWIN (7800)
Field (Reservoir) : BALDWIN (BARNHART)
Field (Reservoir) : BALDWIN (2830 LAGARTO)
Field (Reservoir) : BALDWIN (7050)
Field (Reservoir) : BALDWIN (7100)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 35503371 | 7 | 9/ 9/68 | 0 | 0 |
| 35503323 | 3 | 5/ 7/73 | 500 | 2400 |
| 35503320 | 4 | 5/ 7/73 | 500 | 2400 |
| 35530029 | 3 | 1/25/78 | 450 | 3214 |
| 35530194 | 3 | 0/ 0/ 0 | 450 | 3702 |
| 35503384 | 7 | 0/ 0/ 0 | 0 | 0 |
| 35581386 | 3 | 12/28/83 | 450 | 3370 |
| 35500000 | 6 | 0/ 0/ 0 | 0 | 2850 |
| 35530626 | 7 | 8/ 6/84 | 0 | 1550 |
| 35532795 | 2 | 3/30/93 | 300 | 3530 |
| 35532795 | 2 | 3/30/93 | 300 | 3530 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : NUECES
Field (Reservoir) : CLARA DRISCOLL

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 35530209 | 3 | 9/ 5/86 | 1000 | 3660 |
| 35506494 | 4 | 12/19/86 | 925 | 2200 |
| 35504376 | 4 | 9/26/87 | 1000 | 3802 |
| 35506499 | 3 | 3/15/88 | 950 | 2200 |
| 35532766 | 3 | 1/31/92 | 1000 | 3780 |
| 35533000 | 0 | 3/27/95 | 975 | 2350 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : NUECES
Field (Reservoir) : LONDON GIN
Field (Reservoir) : LONDON GIN (BURKE SAND)
Field (Reservoir) : LONDON GIN (4800)
Field (Reservoir) : LONDON GIN (MASS. CATAHOULA)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 35580498 | 7 | 1/23/79 | 450 | 1500 |
| 35503450 | 4 | 0/ 0/ 0 | 0 | 1500 |
| 35503432 | 4 | 7/12/79 | 350 | 3680 |
| 35503529 | 8 | 0/ 0/ 0 | 0 | 3910 |
| 35503430 | 4 | 2/15/80 | 350 | 3400 |
| 35503517 | 8 | 0/ 0/ 0 | 0 | 0 |
| 35503464 | 6 | 0/ 0/ 0 | 0 | 3588 |
| 35503459 | 3 | 6/24/82 | 350 | 3847 |
| 35580493 | 8 | 11/18/75 | 450 | 3560 |
| 35503460 | 3 | 0/ 0/ 0 | 0 | 3607 |
| 35503429 | 3 | 0/ 0/ 0 | 0 | 0 |
| 35532166 | 3 | 7/ 5/89 | 950 | 2016 |
| 35503465 | 4 | 3/23/90 | 350 | 3600 |
| 35503469 | 3 | 7/13/92 | 350 | 4433 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : NUECES
Field (Reservoir) : RICHARD KING
Field (Reservoir) : RICHARD KING (5600 UPPER)
Field (Reservoir) : RICHARD KING (5400 UPPER)
Field (Reservoir) : RICHARD KING (5875)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 35581655 | 8 | 0/ 0/ 0 | 0 | 1600 |
| 35500074 | 3 | 3/24/80 | 1100 | 2050 |
| 35500096 | 7 | 2/ 4/66 | 0 | 2350 |
| 35530693 | 3 | 0/ 0/ 0 | 0 | 2203 |
| 35530320 | 4 | 0/ 0/ 0 | 0 | 2390 |
| 35500157 | 6 | 0/ 0/ 0 | 0 | 5654 |
| 35500109 | 3 | 0/ 0/ 0 | 0 | 2268 |
| 35530613 | 2 | 0/ 0/ 0 | 1150 | 2260 |
| 35500179 | 3 | 0/ 0/ 0 | 750 | 2320 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : NUECES
Field (Reservoir) : SAXET
Field (Reservoir) : SAXET ( 1 900)
Field (Reservoir) : SAXET ( 3 300)
Field (Reservoir) : SAXET ( 2 800)
Field (Reservoir) : SAXET ( 2 400)
Field (Reservoir) : SAXET ( FRIO)
Field (Reservoir) : SAXET ( 3 000)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 35501559 | 8 | 4/ 2/73 | 100 | 3546 |
| 35506157 | 3 | 0/ 0/ 0 | 0 | 5316 |
| 35501812 | 7 | 3/ 2/73 | 0 | 3665 |
| 35502145 | 7 | 0/ 0/ 0 | 300 | 3374 |
| 35501434 | 3 | 8/ 3/73 | 100 | 3444 |
| 35501799 | 3 | 2/23/73 | 100 | 3660 |
| 35502132 | 7 | 6/14/71 | 0 | 0 |
| 35501948 | 7 | 7/24/74 | 0 | 3650 |
| 35501569 | 3 | 8/ 3/77 | 100 | 3605 |
| 35502361 | 8 | 3/13/73 | 0 | 3715 |
| 35582199 | 8 | 6/ 6/73 | 900 | 3640 |
| 35505808 | 3 | 0/ 0/ 0 | 0 | 3500 |
| 35581735 | 3 | 0/ 0/ 0 | 0 | 3150 |
| 35502031 | 7 | 0/ 0/ 0 | 0 | 2148 |
| 35501524 | 7 | 0/ 0/ 0 | 0 | 2396 |
| 35506034 | 3 | 0/ 0/ 0 | 0 | 3643 |
| 35580707 | 8 | 2/24/73 | 100 | 3734 |
| 35506040 | 3 | 9/27/89 | 100 | 1779 |
| 35501564 | 3 | 1/23/92 | 100 | 3900 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : NUECES
Field (Reservoir) : WHITE POINT EAST
Field (Reservoir) : WHITE POINT EAST (2300)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 35502191 | 3 | 6/30/93 | 100 | 3040 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : REFUGIO
Field (Reservoir) : BONNIE VIEW
Field (Reservoir) : BONNIE VIEW (4200 D-1)
Field (Reservoir) : BONNIE VIEW (FRIO 4650)
Field (Reservoir) : BONNIE VIEW (4550 STRINGER)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 39103571 | 6 | 0/ 0/ 0 | 0 | 0 |
| 39103558 | 3 | 3/22/73 | 1100 | 3650 |
| 39180445 | 6 | 5/11/73 | 1200 | 3630 |
| 39103582 | 3 | 3/22/73 | 1160 | 3650 |
| 39103603 | 8 | 3/22/73 | 0 | 3362 |
| 39180436 | 8 | 4/ 3/73 | 0 | 4495 |
| 39103624 | 8 | 7/30/73 | 0 | 3975 |
| 39103571 | 3 | 6/ 4/74 | 1150 | 3680 |
| 39131436 | 6 | 0/ 0/ 0 | 0 | 3840 |
| 39103619 | 3 | 1/23/90 | 1125 | 3650 |
| 39131761 | 3 | 0/ 0/ 0 | 1150 | 3650 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : REFUGIO
Field (Reservoir) : GRETA (MASSIVE CATAHOULA)
Field (Reservoir) : GRETA (O-6)
Field (Reservoir) : GRETA (4400)
Field (Reservoir) : GRETA (O-4)
Field (Reservoir) : GRETA (C-1)
Field (Reservoir) : GRETA (C-2)
Field (Reservoir) : GRETA (F-2 WEST)
Field (Reservoir) : GRETA (L- 2)
Field (Reservoir) : GRETA (L- 3)
Field (Reservoir) : GRETA (L- 4)
Field (Reservoir) : GRETA (L-13)
Field (Reservoir) : GRETA (L-14 SOUTH)
Field (Reservoir) : GRETA (O-1)
Field (Reservoir) : GRETA (L-15)
Field (Reservoir) : GRETA (L- 5)
Field (Reservoir) : GRETA (L-16)
Field (Reservoir) : GRETA (C-5)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 39101213 | 3 | 6/17/71 | 1250 | 3600 |
| 39181500 | 3 | 11/27/78 | 1350 | 3356 |
| 39100916 | 7 | 0/ 0/ 0 | 0 | 0 |
| 39130227 | 3 | 7/27/72 | 1300 | 3450 |
| 39100990 | 6 | 9/29/73 | 0 | 3654 |
| 39100994 | 6 | 2/15/78 | 1250 | 2740 |
| 39100917 | 4 | 8/ 7/79 | 1250 | 2696 |
| 39101003 | 8 | 10/13/70 | 0 | 3980 |
| 39100794 | 8 | 7/25/69 | 1300 | 3565 |
| 39100795 | 8 | 7/ 5/74 | 0 | 3620 |
| 39130183 | 3 | 8/15/85 | 1200 | 3155 |
| 39100866 | 3 | 4/10/86 | 1250 | 3100 |
| 39100875 | 3 | 9/14/70 | 1325 | 3100 |
| 39100878 | 3 | 3/23/72 | 1250 | 3100 |
| 39100879 | 3 | 3/23/77 | 1250 | 3510 |
| 39130209 | 3 | 2/28/85 | 1250 | 3146 |
| 39100894 | 7 | 2/28/54 | 0 | 1944 |
| 39130252 | 3 | 5/21/74 | 1300 | 3500 |
| 39101208 | 3 | 0/ 0/ 0 | 1650 | 3550 |
| 39101202 | 3 | 12/10/76 | 1650 | 3575 |
| 39101205 | 3 | 2/14/57 | 1300 | 3600 |
| 39100932 | 4 | 9/14/76 | 1450 | 3470 |
| 39100933 | 4 | 3/15/74 | 0 | 38 |
| 39100939 | 8 | 11/14/80 | 1300 | 3500 |
| 39101045 | 3 | 8/22/72 | 0 | 3326 |
| 39101056 | 8 | 2/ 1/73 | 0 | 4525 |
| 39181491 | 3 | 0/ 0/ 0 | 0 | 3575 |
| 39130062 | 3 | 11/ 9/78 | 1325 | 3189 |
| 39101021 | 3 | 2/26/79 | 1250 | 3798 |
| 39100920 | 7 | 8/ 6/73 | 0 | 3534 |
| 39100807 | 7 | 10/23/73 | 0 | 3500 |
| 39101014 | 3 | 4/ 7/69 | 1275 | 3342 |
| 39100987 | 6 | 7/ 8/71 | 1300 | 3550 |
| 39100742 | 8 | 5/26/71 | 1250 | 1710 |
| 39101025 | 7 | 0/ 0/ 0 | 0 | 1868 |

| | | | | |
|---|---|---|---|---|
| 39102025 | 8 | 3/22/79 | 1200 | 1815 |
| 39100450 | 3 | 3/22/79 | 1200 | 1795 |
| 39101046 | 6 | 0/ 0/ 0 | 1400 | 3328 |
| 39101258 | 8 | 2/16/68 | 0 | 1600 |
| 39130197 | 7 | 0/ 0/ 0 | 0 | 1900 |
| 39101025 | 7 | 0/ 0/ 0 | 0 | 1868 |
| 39100903 | 6 | 0/ 0/ 0 | 0 | 0 |
| 39101246 | 3 | 11/ 8/68 | 1200 | 3800 |
| 39100903 | 6 | 0/ 0/ 0 | 0 | 0 |
| 39100652 | 3 | 8/ 1/79 | 0 | 3206 |
| 39101565 | 8 | 8/ 9/79 | 1375 | 3379 |
| 39101002 | 8 | 3/ 8/54 | 1100 | 3865 |
| 39100913 | 6 | 2/17/81 | 0 | 3438 |
| 39182074 | 7 | 2/ 4/58 | 0 | 3750 |
| 39100996 | 8 | 4/11/80 | 0 | 2730 |
| 39100868 | 3 | 4/10/86 | 0 | 3100 |
| 39130189 | 6 | 3/ 7/80 | 0 | 3250 |
| 39100796 | 7 | 0/ 0/ 0 | 0 | 1915 |
| 39100996 | 7 | 4/11/80 | 0 | 2730 |
| 39100721 | 3 | 0/ 0/ 0 | 1350 | 3198 |
| 39100740 | 7 | 0/ 0/ 0 | 0 | 1925 |
| 39130295 | 8 | 6/17/83 | 0 | 3470 |
| 39100791 | 7 | 0/ 0/ 0 | 1300 | 3530 |
| 39102021 | 8 | 0/ 0/ 0 | 0 | 3401 |
| 39180926 | 7 | 6/11/80 | 1315 | 4407 |
| 39131490 | 6 | 7/12/84 | 0 | 3120 |
| 39130198 | 7 | 0/ 0/ 0 | 0 | 1750 |
| 39131490 | 3 | 7/12/84 | 1250 | 3120 |
| 39100000 | 6 | 7/30/87 | 1250 | 3710 |
| 39100804 | 8 | 1/10/86 | 0 | 3140 |
| 39100864 | 3 | 4/10/86 | 1250 | 3100 |
| 39100797 | 4 | 8/15/85 | 1250 | 3148 |
| 39100862 | 2 | 7/ 8/86 | 1250 | 3100 |
| 39100000 | 6 | 6/20/86 | 0 | 3130 |
| 39130118 | 6 | 0/ 0/ 0 | 1350 | 2200 |
| 39101046 | 3 | 7/16/85 | 1400 | 3180 |
| 39131756 | 4 | 0/ 0/ 0 | 1400 | 3140 |
| 39101027 | 3 | 7/22/85 | 1250 | 3136 |
| 39100642 | 5 | 12/ 8/88 | 1400 | 3354 |
| 39100743 | 3 | 4/24/90 | 1325 | 2200 |
| 39103798 | 3 | 7/23/90 | 1350 | 2925 |
| 39131634 | 3 | 8/22/90 | 1325 | 4400 |
| 39100817 | 2 | 8/ 3/90 | 0 | 4350 |
| 39100000 | 2 | 8/ 3/90 | 0 | 4350 |
| 39100962 | 3 | 1/21/91 | 1350 | 4352 |
| 39131158 | 2 | 1/14/91 | 1275 | 4340 |
| 39100983 | 3 | 5/14/91 | 1300 | 3550 |
| 39100957 | 3 | 7/12/91 | 1350 | 4352 |
| 39100780 | 2 | 4/13/93 | 1325 | 4350 |
| 39101050 | 3 | 7/ 1/93 | 1275 | 4361 |
| 39100875 | 6 | 7/15/94 | 1250 | 3100 |
| 39100912 | 0 | 8/31/94 | 1275 | 4250 |
| 39130338 | 0 | 9/30/94 | 1325 | 4360 |
| 39182067 | 0 | 9/30/94 | 1325 | 4350 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : REFUGIO
Field (Reservoir) : LAKE PASTURE
Field (Reservoir) : LAKE PASTURE (FS-515)
Field (Reservoir) : LAKE PASTURE (FS-538)
Field (Reservoir) : LAKE PASTURE (FT-569)
Field (Reservoir) : LAKE PASTURE (H-440 SAND)
Field (Reservoir) : LAKE PASTURE (FS-509)
Field (Reservoir) : LAKE PASTURE (M-330)
Field (Reservoir) : LAKE PASTURE (M-295)
Field (Reservoir) : LAKE PASTURE (FS-503)
Field (Reservoir) : LAKE PASTURE (6050)
Field (Reservoir) : LAKE PASTURE (H-434)
Field (Reservoir) : LAKE PASTURE (L-206)
Field (Reservoir) : LAKE PASTURE (FS-536)
Field (Reservoir) : LAKE PASTURE (FT-562)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 39100353 | 3 | 8/10/78 | 0 | 3726 |
| 39100218 | 8 | 6/27/79 | 1500 | 3849 |
| 39130281 | 3 | 4/20/79 | 0 | 3940 |
| 39180858 | 3 | 3/29/56 | 1525 | 3810 |
| 39100220 | 5 | 8/19/64 | 1500 | 5381 |
| 39100272 | 6 | 8/16/71 | 1300 | 5700 |
| 39100295 | 6 | 8/12/77 | 1300 | 5755 |
| 39104012 | 3 | 3/ 8/77 | 1300 | 5734 |
| 39100267 | 4 | 4/ 5/73 | 1300 | 5700 |
| 39182081 | 3 | 7/13/64 | 1475 | 4434 |
| 39131175 | 3 | 10/14/77 | 1500 | 3740 |
| 39104042 | 3 | 6/14/77 | 1500 | 4447 |
| 39100291 | 4 | 1/27/77 | 1500 | 4440 |
| 39130323 | 6 | 2/20/76 | 0 | 3720 |
| 39100363 | 3 | 10/ 6/77 | 1350 | 4456 |
| 39100267 | 6 | 0/ 0/ 0 | 0 | 5772 |
| 39100380 | 3 | 0/ 0/ 0 | 0 | 3760 |
| 39100382 | 3 | 0/ 0/ 0 | 1525 | 3770 |
| 39100384 | 3 | 11/30/77 | 1525 | 3894 |
| 39100385 | 3 | 0/ 0/ 0 | 0 | 3750 |
| 39130026 | 3 | 5/12/74 | 1350 | 4431 |
| 39100202 | 3 | 10/ 2/73 | 1350 | 3733 |
| 39100229 | 6 | 7/10/68 | 0 | 3724 |
| 39131192 | 4 | 0/ 0/ 0 | 1500 | 3820 |
| 39100325 | 3 | 8/31/72 | 1500 | 3700 |
| 39100326 | 3 | 7/ 5/76 | 1350 | 4460 |
| 39130513 | 3 | 9/22/76 | 1500 | 3898 |
| 39131224 | 6 | 6/ 2/78 | 1500 | 3740 |
| 39100495 | 3 | 3/22/72 | 1500 | 3765 |
| 39100205 | 8 | 10/23/79 | 1300 | 3380 |
| 39181544 | 3 | 2/ 9/81 | 1500 | 4150 |
| 39130534 | 3 | 7/11/80 | 1500 | 3416 |
| 39130332 | 4 | 11/18/80 | 1500 | 6520 |
| 39100349 | 4 | 11/12/80 | 1500 | 4110 |
| 39181960 | 3 | 0/ 0/ 0 | 0 | 3890 |
| 39131190 | 6 | 0/ 0/ 0 | 0 | 3920 |
| 39100000 | 6 | 4/20/79 | 0 | 3940 |
| 39100000 | 6 | 8/10/78 | 0 | 3726 |

| | | | | |
|---|---|---|---|---|
| 39130534 | 6 | 0/ 0/ 0 | 0 | 3750 |
| 39100273 | 6 | 4/ 4/84 | 0 | 4440 |
| 39130327 | 6 | 0/ 0/ 0 | 0 | 3760 |
| 39100206 | 3 | 6/11/84 | 1500 | 3660 |
| 39131260 | 6 | 0/ 0/ 0 | 0 | 3466 |
| 39131196 | 5 | 10/23/84 | 1500 | 3074 |
| 39130327 | 3 | 0/ 0/ 0 | 1500 | 3760 |
| 39131260 | 3 | 0/ 0/ 0 | 0 | 3466 |
| 39131244 | 8 | 4/25/84 | 0 | 4530 |
| 39131737 | 3 | 7/12/84 | 0 | 4510 |
| 39100270 | 3 | 1/13/71 | 1350 | 4432 |
| 39131781 | 3 | 6/15/87 | 1450 | 3770 |
| 39100371 | 3 | 11/20/84 | 1500 | 3821 |
| 39100224 | 3 | 10/28/88 | 1500 | 3835 |
| 39100301 | 6 | 1/ 1/ 1 | 0 | 0 |
| 39131789 | 3 | 2/ 5/91 | 1450 | 4427 |
| 39103783 | 3 | 2/19/91 | 1475 | 5696 |
| 39130229 | 3 | 6/ 3/92 | 1475 | 4396 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : REFUGIO
Field (Reservoir) : LA ROSA
Field (Reservoir) : LA ROSA (SPAULDING)
Field (Reservoir) : LA ROSA (5900 SAND)
Field (Reservoir) : LA ROSA (6000)
Field (Reservoir) : LA ROSA (4800)
Field (Reservoir) : LA ROSA (6800)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 39103371 | 4 | 11/ 9/76 | 1200 | 4500 |
| 39181052 | 7 | 3/10/76 | 0 | 4525 |
| 39103384 | 3 | 8/23/65 | 0 | 4500 |
| 39103393 | 4 | 0/ 0/ 0 | 1200 | 2650 |
| 39181055 | 8 | 5/ 3/71 | 0 | 4000 |
| 39103422 | 5 | 2/15/78 | 1000 | 4730 |
| 39103412 | 7 | 1/ 3/67 | 0 | 4500 |
| 39180714 | 7 | 9/ 7/71 | 0 | 0 |
| 39103319 | 7 | 2/ 2/54 | 0 | 4700 |
| 39103424 | 4 | 3/ 3/54 | 1000 | 4868 |
| 39103408 | 3 | 9/19/72 | 1200 | 4500 |
| 39103382 | 8 | 0/ 0/ 0 | 1200 | 2650 |
| 39103407 | 7 | 6/23/67 | 0 | 4513 |
| 39103370 | 7 | 0/ 0/ 0 | 0 | 4000 |
| 39103320 | 4 | 0/ 0/ 0 | 0 | 4882 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : REFUGIO
Field (Reservoir) : MCFADDIN (4400)
Field (Reservoir) : MCFADDIN (5300)
Field (Reservoir) : MCFADDIN (2200)
Field (Reservoir) : MCFADDIN (2250)
Field (Reservoir) : MCFADDIN (2300)
Field (Reservoir) : MCFADDIN
Field (Reservoir) : MCFADDIN (3200)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 39100245 | 3 | 8/ 9/74 | 1350 | 3796 |
| 39103865 | 3 | 0/ 0/ 0 | 1350 | 2211 |
| 39100177 | 7 | 8/ 1/72 | 0 | 1635 |
| 39100061 | 6 | 0/ 0/ 0 | 0 | 0 |
| 39180021 | 3 | 8/ 6/68 | 1640 | 2000 |
| 39181543 | 3 | 0/ 0/ 0 | 1320 | 2070 |
| 39131226 | 7 | 0/ 0/ 0 | 0 | 2284 |
| 39130214 | 3 | 0/ 0/ 0 | 0 | 3274 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : REFUGIO
Field (Reservoir) : MARY ELLEN OCONNOR (FQ- 9)
Field (Reservoir) : MARY ELLEN OCONNOR (FQ-40 SAND)
Field (Reservoir) : MARY ELLEN OCONNOR (FS-96)
Field (Reservoir) : MARY ELLEN OCONNOR (FT-18 SAND)
Field (Reservoir) : MARY ELLEN OCONNOR (D-1)
Field (Reservoir) : MARY ELLEN OCONNOR (FQ-25)
Field (Reservoir) : MARY ELLEN OCONNOR (FQ-30)
Field (Reservoir) : MARY ELLEN OCONNOR (FS-1)
Field (Reservoir) : MARY ELLEN OCONNOR (H- 12)
Field (Reservoir) : MARY ELLEN OCONNOR (5000)
Field (Reservoir) : MARY ELLEN OCONNOR (FS-75)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 39101861 | 8 | 0/ 0/ 0 | 1300 | 3600 |
| 39101868 | 8 | 8/14/68 | 0 | 2585 |
| 39101930 | 8 | 11/ 6/73 | 0 | 3555 |
| 39101945 | 8 | 11/28/73 | 0 | 3600 |
| 39101820 | 3 | 1/ 1/ 1 | 1200 | 3852 |
| 39101838 | 3 | 0/ 0/ 0 | 1000 | 3597 |
| 39101804 | 8 | 0/ 0/ 0 | 0 | 4050 |
| 39120348 | 4 | 1/ 2/70 | 1300 | 2576 |
| 39103684 | 6 | 9/14/72 | 0 | 2570 |
| 39101834 | 3 | 11/13/72 | 1300 | 3950 |
| 39101973 | 8 | 6/21/73 | 1300 | 3590 |
| 39101835 | 8 | 8/ 5/71 | 0 | 3917 |
| 39101945 | 8 | 0/ 0/ 0 | 0 | 0 |
| 39101931 | 3 | 0/ 0/ 0 | 1300 | 4445 |
| 39101861 | 8 | 0/ 0/ 0 | 0 | 0 |
| 39101878 | 8 | 2/ 4/74 | 0 | 3600 |
| 39130481 | 6 | 6/26/79 | 1200 | 3620 |
| 39130009 | 3 | 0/ 0/ 0 | 0 | 1800 |
| 39101875 | 8 | 5/ 2/84 | 1200 | 3595 |
| 39131217 | 4 | 0/ 0/ 0 | 1200 | 4240 |
| 39101894 | 0 | 5/25/94 | 1200 | 3580 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : REFUGIO
Field (Reservoir) : REFUGIO NEW
Field (Reservoir) : REFUGIO NEW (3670)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 39182012 | 7 | 11/29/73 | 0 | 4900 |
| 39103017 | 3 | 5/24/68 | 1250 | 3870 |
| 39103023 | 8 | 0/ 0/ 0 | 0 | 3616 |
| 39102575 | 3 | 9/20/74 | 1300 | 4210 |
| 39103027 | 3 | 0/ 0/ 0 | 0 | 3900 |
| 39102985 | 3 | 2/ 4/88 | 1000 | 2610 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : REFUGIO
Field (Reservoir) : REFUGIO OLD
Field (Reservoir) : REFUGIO OLD (6400)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 39181492 | 6 | 12/22/76 | 0 | 3530 |
| 39102467 | 7 | 0/ 0/ 0 | 0 | 5000 |
| 39102648 | 5 | 3/12/73 | 1280 | 3100 |
| 39180063 | 7 | 0/ 0/ 0 | 0 | 5675 |
| 39131393 | 8 | 11/ 7/80 | 1250 | 3770 |
| 39180537 | 8 | 6/ 6/73 | 0 | 5514 |
| 39102196 | 8 | 0/ 0/ 0 | 0 | 1750 |
| 39180897 | 7 | 0/ 0/ 0 | 0 | 3625 |
| 39102479 | 8 | 0/ 0/ 0 | 0 | 4420 |
| 39182025 | 3 | 12/15/61 | 0 | 4290 |
| 39102212 | 4 | 0/ 0/ 0 | 1200 | 4300 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : REFUGIO
Field (Reservoir) : TOM OCONNOR
Field (Reservoir) : TOM OCONNOR (5800)
Field (Reservoir) : TOM OCONNOR (5100 EAST)
Field (Reservoir) : TOM OCONNOR (4400)
Field (Reservoir) : TOM OCONNOR (4500 GRETA MASS.)
Field (Reservoir) : TOM OCONNOR (5400 SAND)
Field (Reservoir) : TOM OCONNOR (5500 SAND)
Field (Reservoir) : TOM OCONNOR (5425 SAND)
Field (Reservoir) : TOM OCONNOR (3900)
Field (Reservoir) : TOM OCONNOR (3500)
Field (Reservoir) : TOM OCONNOR (3550)
Field (Reservoir) : TOM OCONNOR (5300 EAST)
Field (Reservoir) : TOM OCONNOR (5440)
Field (Reservoir) : TOM OCONNOR (5680)
Field (Reservoir) : TOM OCONNOR (7930)
Field (Reservoir) : TOM OCONNOR (3560)
Field (Reservoir) : TOM OCONNOR (4150)
Field (Reservoir) : TOM OCONNOR (5900 SAND)
Field (Reservoir) : TOM OCONNOR (4200)
Field (Reservoir) : TOM OCONNOR (5770 U SOUTH)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 39102040 | 3 | 3/17/55 | 1300 | 3700 |
| 39101653 | 3 | 4/ 9/70 | 1300 | 3865 |
| 39101661 | 3 | 12/16/70 | 1250 | 3855 |
| 39101674 | 8 | 3/17/55 | 0 | 3700 |
| 39101679 | 7 | 4/ 9/53 | 0 | 3800 |
| 39101691 | 4 | 6/16/78 | 1250 | 5878 |
| 39101408 | 3 | 1/15/80 | 1300 | 3125 |
| 39101410 | 4 | 11/24/75 | 1200 | 3900 |
| 39103944 | 8 | 0/ 0/ 0 | 1300 | 3680 |
| 39182065 | 3 | 5/18/70 | 1230 | 3690 |
| 39130165 | 3 | 0/ 0/ 0 | 0 | 3204 |
| 39104056 | 3 | 8/30/77 | 1380 | 3622 |
| 39100571 | 3 | 11/28/73 | 1350 | 3768 |
| 39100573 | 4 | 3/12/73 | 1350 | 3760 |
| 39100574 | 6 | 5/ 1/72 | 1350 | 3778 |
| 39101536 | 6 | 0/ 0/ 0 | 0 | 3690 |
| 39102031 | 3 | 12/ 5/72 | 0 | 3680 |
| 39101555 | 3 | 1/29/79 | 1400 | 3002 |
| 39102032 | 3 | 4/20/72 | 1380 | 3770 |
| 39102022 | 6 | 12/11/75 | 1350 | 3780 |
| 39102024 | 8 | 11/ 3/72 | 1350 | 3740 |
| 39181447 | 6 | 0/ 0/ 0 | 0 | 0 |
| 39100470 | 6 | 1/10/69 | 1300 | 3594 |
| 39100444 | 3 | 2/ 1/73 | 0 | 2950 |
| 39100458 | 3 | 12/ 5/78 | 1360 | 3383 |
| 39100460 | 3 | 5/ 4/78 | 1360 | 3270 |
| 39181308 | 3 | 3/22/79 | 0 | 3052 |
| 39101322 | 3 | 10/16/74 | 1200 | 3680 |
| 39103954 | 3 | 4/18/68 | 0 | 4010 |
| 39101700 | 3 | 9/11/67 | 0 | 3675 |
| 39102023 | 4 | 11/19/71 | 1250 | 3830 |
| 39100721 | 6 | 11/27/81 | 0 | 3125 |

| | | | | |
|---|---|---|---|---|
| 39180918 | 3 | 0/ 0/ 0 | 0 | 3630 |
| 39101525 | 7 | 0/ 0/ 0 | 0 | 3820 |
| 39101760 | 7 | 9/ 3/74 | 0 | 3790 |
| 39101361 | 3 | 0/ 0/ 0 | 1300 | 3650 |
| 39101381 | 3 | 0/ 0/ 0 | 1250 | 3618 |
| 39102035 | 3 | 0/ 0/ 0 | 1400 | 3810 |
| 39103950 | 8 | 5/13/66 | 0 | 3180 |
| 39101325 | 3 | 5/19/75 | 1300 | 3670 |
| 39181220 | 8 | 4/22/54 | 1250 | 3800 |
| 39101652 | 3 | 12/ 1/76 | 1350 | 3915 |
| 39101668 | 3 | 7/ 1/76 | 1350 | 5894 |
| 39101669 | 3 | 7/ 1/76 | 1350 | 5903 |
| 39101684 | 3 | 7/ 1/76 | 1350 | 5867 |
| 39101580 | 6 | 0/ 0/ 0 | 0 | 3753 |
| 39101536 | 3 | 7/ 9/76 | 1400 | 3690 |
| 39101554 | 3 | 1/29/79 | 1400 | 3257 |
| 39101503 | 4 | 3/31/78 | 1350 | 3284 |
| 39181447 | 3 | 0/ 0/ 0 | 1400 | 3378 |
| 39100421 | 6 | 1/26/79 | 0 | 5800 |
| 39100482 | 3 | 0/ 0/ 0 | 1500 | 3385 |
| 39100490 | 6 | 7/ 1/76 | 1350 | 5900 |
| 39101546 | 6 | 0/ 0/ 0 | 0 | 3090 |
| 39101556 | 3 | 2/18/77 | 1400 | 3800 |
| 39101766 | 6 | 6/ 1/76 | 0 | 0 |
| 39131401 | 6 | 5/ 8/80 | 1250 | 6500 |
| 39100754 | 3 | 5/ 9/66 | 0 | 3607 |
| 39101451 | 4 | 8/29/63 | 1250 | 3804 |
| 39101377 | 8 | 1/14/77 | 0 | 3880 |
| 39100752 | 3 | 5/ 1/72 | 1300 | 3820 |
| 39101450 | 3 | 9/14/70 | 1350 | 3766 |
| 39101360 | 3 | 3/12/68 | 1250 | 3800 |
| 39102620 | 3 | 11/ 7/80 | 1250 | 3807 |
| 39101114 | 3 | 0/ 0/ 0 | 1200 | 3624 |
| 39101648 | 7 | 6/16/78 | 0 | 0 |
| 39101527 | 3 | 1/30/79 | 0 | 3846 |
| 39101403 | 3 | 6/27/69 | 1350 | 3880 |
| 39101452 | 3 | 5/ 6/74 | 0 | 3625 |
| 39100848 | 3 | 0/ 0/ 0 | 1350 | 3790 |
| 39101232 | 3 | 0/ 0/ 0 | 1400 | 3675 |
| 39130588 | 6 | 1/27/81 | 0 | 0 |
| 39101455 | 8 | 4/12/78 | 1250 | 3876 |
| 39101756 | 8 | 0/ 0/ 0 | 0 | 3840 |
| 39101657 | 4 | 9/28/81 | 1250 | 5827 |
| 39180636 | 8 | 0/ 0/ 0 | 0 | 1955 |
| 39130588 | 6 | 1/27/81 | 1300 | 6580 |
| 39100709 | 3 | 0/ 0/ 0 | 0 | 3639 |
| 39130206 | 2 | 2/17/82 | 1400 | 4322 |
| 39101757 | 3 | 0/ 0/ 0 | 0 | 3833 |
| 39100754 | 6 | 5/ 2/66 | 0 | 0 |
| 39100774 | 6 | 10/18/82 | 0 | 3880 |
| 39101313 | 3 | 1/31/83 | 0 | 3890 |
| 39101677 | 6 | 0/ 0/ 0 | 0 | 5165 |
| 39100000 | 6 | 0/ 0/ 0 | 0 | 3335 |
| 39130078 | 6 | 0/ 0/ 0 | 0 | 3784 |
| 39101762 | 6 | 0/ 0/ 0 | 0 | 3855 |
| 39130046 | 3 | 0/ 0/ 0 | 0 | 3650 |
| 39101764 | 6 | 0/ 0/ 0 | 0 | 3860 |
| 39101759 | 3 | 0/ 0/ 0 | 0 | 3295 |
| 39101372 | 6 | 0/ 0/ 0 | 0 | 3200 |
| 39100000 | 6 | 0/ 0/ 0 | 0 | 3876 |

| | | | | |
|---|---|---|---|---|
| 39100000 | 6 | 0/ 0/ 0 | 0 | 3435 |
| 39101554 | 6 | 1/29/79 | 1400 | 3257 |
| 39100000 | 6 | 0/ 0/ 0 | 0 | 3780 |
| 39100000 | 6 | 12/ 5/78 | 0 | 3383 |
| 39181357 | 6 | 0/ 0/ 0 | 0 | 3441 |
| 39100000 | 6 | 0/ 0/ 0 | 0 | 3050 |
| 39100000 | 6 | 0/ 0/ 0 | 0 | 3690 |
| 39101613 | 3 | 0/ 0/ 0 | 0 | 5872 |
| 39100747 | 3 | 0/ 0/ 0 | 0 | 5867 |
| 39100569 | 3 | 0/ 0/ 0 | 0 | 5798 |
| 39100420 | 6 | 0/ 0/ 0 | 0 | 5788 |
| 39100849 | 3 | 0/ 0/ 0 | 0 | 5888 |
| 39100528 | 3 | 0/ 0/ 0 | 0 | 5851 |
| 39103784 | 5 | 3/ 9/84 | 0 | 5891 |
| 39101677 | 6 | 0/ 0/ 0 | 0 | 5848 |
| 39101651 | 3 | 0/ 0/ 0 | 0 | 5840 |
| 39181954 | 8 | 10/16/70 | 0 | 3611 |
| 39131742 | 6 | 0/ 0/ 0 | 0 | 5778 |
| 39131743 | 6 | 0/ 0/ 0 | 0 | 5758 |
| 39131744 | 6 | 0/ 0/ 0 | 0 | 5768 |
| 39101631 | 4 | 0/ 0/ 0 | 0 | 3790 |
| 39100801 | 4 | 8/ 6/84 | 0 | 5919 |
| 39101621 | 3 | 0/ 0/ 0 | 0 | 5800 |
| 39100570 | 3 | 0/ 0/ 0 | 0 | 5770 |
| 39181459 | 3 | 0/ 0/ 0 | 0 | 5807 |
| 39101406 | 3 | 0/ 0/ 0 | 0 | 3235 |
| 39100741 | 8 | 2/15/85 | 1375 | 1700 |
| 39103795 | 5 | 0/ 0/ 0 | 0 | 3790 |
| 39101699 | 3 | 0/ 0/ 0 | 0 | 5834 |
| 39100419 | 3 | 0/ 0/ 0 | 0 | 5780 |
| 39100768 | 3 | 0/ 0/ 0 | 0 | 3766 |
| 39100710 | 3 | 1/ 8/86 | 1400 | 3678 |
| 39181448 | 3 | 0/ 0/ 0 | 0 | 5749 |
| 39100422 | 3 | 0/ 0/ 0 | 0 | 5775 |
| 39101609 | 6 | 5/27/86 | 1300 | 5852 |
| 39101580 | 3 | 10/13/86 | 1375 | 3455 |
| 39101720 | 3 | 0/ 0/ 0 | 1250 | 5812 |
| 39100418 | 3 | 0/ 0/ 0 | 1350 | 5757 |
| 39101588 | 3 | 0/ 0/ 0 | 1250 | 5797 |
| 39101593 | 3 | 0/ 0/ 0 | 1250 | 5808 |
| 39100671 | 5 | 6/ 1/76 | 1400 | 5716 |
| 39101561 | 3 | 0/ 0/ 0 | 1400 | 5769 |
| 39100708 | 3 | 8/27/87 | 1350 | 5734 |
| 39101140 | 6 | 0/ 0/ 0 | 1400 | 5743 |
| 39101151 | 5 | 0/ 0/ 0 | 1400 | 5738 |
| 39103867 | 3 | 6/ 1/86 | 1300 | 5788 |
| 39101600 | 3 | 0/ 0/ 0 | 1300 | 5841 |
| 39101727 | 3 | 6/14/89 | 1300 | 5842 |
| 39101559 | 6 | 6/14/89 | 1375 | 5838 |
| 39101310 | 3 | 7/26/89 | 1200 | 5860 |
| 39101312 | 3 | 7/26/89 | 1200 | 5840 |
| 39101506 | 3 | 9/ 1/89 | 1350 | 5794 |
| 39101327 | 3 | 9/27/89 | 1200 | 5887 |
| 39101566 | 3 | 6/ 1/76 | 1400 | 5696 |
| 39101744 | 3 | 6/ 1/76 | 1300 | 5846 |
| 39101745 | 3 | 6/ 1/76 | 100 | 5822 |
| 39101563 | 3 | 0/ 0/ 0 | 1400 | 5814 |
| 39101558 | 2 | 5/31/90 | 1375 | 5841 |
| 39101504 | 3 | 7/13/90 | 1350 | 5770 |
| 39101512 | 3 | 7/13/90 | 1350 | 5740 |

| | | | | |
|---|---|---|---|---|
| 39101514 | 3 | 7/13/90 | 1350 | 5739 |
| 39181273 | 6 | 8/30/90 | 1250 | 5796 |
| 39101714 | 3 | 8/30/90 | 1250 | 5777 |
| 39101731 | 2 | 12/10/90 | 1250 | 5784 |
| 39131679 | 3 | 1/21/92 | 1300 | 3644 |
| 39101637 | 3 | 3/31/92 | 1300 | 3600 |
| 39101636 | 2 | 9/ 8/92 | 1300 | 3600 |
| 39101581 | 3 | 6/14/93 | 1300 | 5784 |
| 39132034 | 0 | 11/10/93 | 1350 | 5900 |
| 39101460 | 0 | 1/10/94 | 1300 | 5734 |
| 39101499 | 0 | 3/31/94 | 1450 | 3690 |
| 39101589 | 0 | 9/21/94 | 1300 | 5810 |
| 39101123 | 0 | 9/21/94 | 1350 | 5885 |
| 39101518 | 0 | 9/21/94 | 1350 | 5749 |

| | | | | |
|---|---|---|---|---|
| 3931263 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931374 | 3 | 0/ 0/ 0 | 0 | 0 |
| 3931415 | 3 | 0/ 0/ 0 | 0 | 0 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : SAN PATRICIO
Field (Reservoir) : MIDWAY
Field (Reservoir) : MIDWAY (MAIN MIDWAY SAND)
Field (Reservoir) : MIDWAY (5110)
Field (Reservoir) : MIDWAY (3600)
Field (Reservoir) : MIDWAY (6550-A-)
Field (Reservoir) : MIDWAY (5730)
Field (Reservoir) : MIDWAY (6190)
Field (Reservoir) : MIDWAY (1072)
Field (Reservoir) : MIDWAY (MIOCENE)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 40902572 | 8 | 0/ 0/ 0 | 0 | 3260 |
| 40981124 | 3 | 12/27/72 | 0 | 4140 |
| 40981126 | 8 | 2/ 6/73 | 0 | 1540 |
| 40902737 | 6 | 7/25/79 | 0 | 3240 |
| 40981220 | 4 | 4/23/69 | 300 | 4010 |
| 40902581 | 7 | 0/ 0/ 0 | 0 | 2235 |
| 40902888 | 3 | 7/22/74 | 300 | 1900 |
| 40931235 | 3 | 3/ 5/79 | 0 | 5304 |
| 40980121 | 8 | 0/ 0/ 0 | 0 | 2148 |
| 40930246 | 6 | 0/ 0/ 0 | 350 | 1420 |
| 40981302 | 3 | 3/ 9/64 | 150 | 1604 |
| 40981123 | 4 | 1/18/74 | 300 | 4160 |
| 40981263 | 6 | 0/ 0/ 0 | 0 | 3275 |
| 40931631 | 3 | 1/ 5/83 | 300 | 3655 |
| 40904109 | 4 | 10/ 3/83 | 300 | 2461 |
| 40900000 | 6 | 8/ 7/79 | 300 | 3260 |
| 40902887 | 3 | 7/11/86 | 0 | 2480 |
| 40902580 | 4 | 3/27/69 | 1080 | 5289 |
| 40981263 | 3 | 11/12/93 | 0 | 3140 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : SAN PATRICIO
Field (Reservoir) : ODEM
Field (Reservoir) : ODEM (5900)
Field (Reservoir) : ODEM (6100 UP)
Field (Reservoir) : ODEM (6160)
Field (Reservoir) : ODEM (MASSIVE FRIO)
Field (Reservoir) : ODEM (5050 S.)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 40903757 | 7 | 8/31/71 | 0 | 1610 |
| 40930152 | 6 | 2/25/77 | 0 | 0 |
| 40930221 | 3 | 10/ 7/80 | 350 | 2200 |
| 40930237 | 8 | 0/ 0/ 0 | 0 | 1300 |
| 40903761 | 6 | 0/ 0/ 0 | 0 | 0 |
| 40930219 | 6 | 2/25/77 | 0 | 0 |
| 40930336 | 4 | 2/25/77 | 350 | 6133 |
| 40903808 | 3 | 5/14/81 | 0 | 2350 |
| 40903811 | 3 | 0/ 0/ 0 | 0 | 2702 |
| 40930012 | 3 | 3/15/82 | 350 | 2230 |
| 40903661 | 3 | 5/14/81 | 350 | 3700 |
| 40903665 | 8 | 8/15/63 | 0 | 1465 |
| 40930152 | 6 | 2/25/77 | 300 | 6176 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : SAN PATRICIO
Field (Reservoir) : PLYMOUTH
Field (Reservoir) : PLYMOUTH (MAIN GRETA SAND)
Field (Reservoir) : PLYMOUTH (5800 SAND)
Field (Reservoir) : PLYMOUTH (6100 SAND)
Field (Reservoir) : PLYMOUTH (6500-A)
Field (Reservoir) : PLYMOUTH(6100 SOUTH)
Field (Reservoir) : PLYMOUTH (5100)
Field (Reservoir) : PLYMOUTH (GRETA STRINGER)
Field (Reservoir) : PLYMOUTH (8350)
Field (Reservoir) : PLYMOUTH (5470)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 40901535 | 3 | 1/23/93 | 750 | 4700 |
| 40901953 | 3 | 7/15/77 | 600 | 4150 |
| 40901564 | 4 | 4/25/78 | 0 | 4880 |
| 40901566 | 6 | 1/ 4/73 | 0 | 0 |
| 40901810 | 8 | 10/10/74 | 750 | 4902 |
| 40901570 | 6 | 0/ 0/ 0 | 0 | 0 |
| 40901865 | 3 | 8/10/72 | 0 | 3860 |
| 40901846 | 4 | 9/ 7/72 | 0 | 3875 |
| 40901449 | 7 | 2/15/80 | 500 | 4150 |
| 40901451 | 7 | 9/22/76 | 600 | 4100 |
| 40901452 | 3 | 12/17/71 | 600 | 4080 |
| 40901873 | 3 | 11/13/72 | 0 | 4760 |
| 40901876 | 8 | 11/13/72 | 0 | 4870 |
| 40901811 | 7 | 11/13/72 | 0 | 4874 |
| 40901812 | 7 | 11/13/72 | 0 | 4910 |
| 40902143 | 8 | 11/13/72 | 0 | 4935 |
| 40902144 | 7 | 11/13/72 | 0 | 4890 |
| 40901774 | 3 | 7/24/72 | 0 | 4000 |
| 40901505 | 4 | 9/27/71 | 750 | 4000 |
| 40901751 | 7 | 7/25/74 | 100 | 1740 |
| 40901755 | 7 | 9/27/71 | 0 | 4000 |
| 40901754 | 6 | 6/24/71 | 0 | 0 |
| 40901595 | 3 | 1/23/73 | 750 | 4708 |
| 40981229 | 8 | 0/ 0/ 0 | 0 | 0 |
| 40930291 | 6 | 0/ 0/ 0 | 0 | 3955 |
| 40901571 | 3 | 3/ 3/77 | 700 | 4750 |
| 40980325 | 4 | 8/19/83 | 0 | 4768 |
| 40902102 | 3 | 0/ 0/ 0 | 0 | 4020 |
| 40901916 | 3 | 0/ 0/ 0 | 0 | 0 |
| 40980327 | 6 | 3/22/82 | 750 | 4690 |
| 40901916 | 3 | 0/ 0/ 0 | 0 | 2733 |
| 40901621 | 6 | 0/ 0/ 0 | 0 | 0 |
| 40901623 | 6 | 0/ 0/ 0 | 0 | 0 |
| 40901628 | 6 | 0/ 0/ 0 | 0 | 0 |
| 40930448 | 6 | 0/ 0/ 0 | 0 | 0 |
| 40930449 | 6 | 0/ 0/ 0 | 0 | 0 |
| 40930544 | 6 | 0/ 0/ 0 | 0 | 0 |
| 40930329 | 6 | 0/ 0/ 0 | 0 | 0 |
| 40901771 | 3 | 0/ 0/ 0 | 750 | 4000 |
| 40903958 | 8 | 0/ 0/ 0 | 0 | 3892 |
| 40901552 | 2 | 0/ 0/ 0 | 0 | 4920 |
| 40930291 | 4 | 6/10/85 | 600 | 3955 |

| | | | | |
|---|---|---|---|---|
| 40930175 | 4 | 0/ 0/ 0 | 0 | 7450 |
| 40901444 | 4 | 0/ 0/ 0 | 600 | 2068 |
| 40981651 | 3 | 2/22/73 | 700 | 4032 |
| 40901796 | 3 | 2/22/73 | 750 | 4700 |
| 40901271 | 8 | 3/14/66 | 750 | 5507 |
| 40901815 | 8 | 3/14/66 | 350 | 5480 |
| 40901803 | 8 | 3/14/66 | 300 | 5492 |
| 40980966 | 8 | 3/14/66 | 400 | 5497 |
| 40901771 | 6 | 7/24/72 | 1080 | 4664 |
| 40980399 | 6 | 7/24/72 | 950 | 4668 |
| 40901762 | 6 | 7/24/72 | 750 | 4685 |
| 40901754 | 6 | 9/27/71 | 750 | 4710 |
| 40901756 | 6 | 9/27/71 | 750 | 4720 |
| 40901759 | 6 | 9/27/71 | 750 | 4710 |
| 40901920 | 2 | 1/ 4/94 | 550 | 1500 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : SAN PATRICIO
Field (Reservoir) : PLYMOUTH EAST
Field (Reservoir) : PLYMOUTH EAST (5100)
Field (Reservoir) : PLYMOUTH EAST (HAVELKA SD.)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 40930079 | 6 | 1/17/74 | 500 | 4813 |
| 40902053 | 8 | 0/ 0/ 0 | 0 | 0 |
| 40981461 | 2 | 0/ 0/ 0 | 500 | 4913 |
| 40980776 | 8 | 11/ 3/72 | 500 | 4820 |
| 40931505 | 4 | 0/ 0/ 0 | 0 | 4895 |
| 40902055 | 3 | 4/ 2/86 | 500 | 1400 |
| 40930079 | 3 | 10/ 9/90 | 500 | 4030 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : SAN PATRICIO
Field (Reservoir) : PORTILLA (5700 SAND)
Field (Reservoir) : PORTILLA (7100 SAND)
Field (Reservoir) : PORTILLA (8100 SAND)
Field (Reservoir) : PORTILLA (7400 SAND)
Field (Reservoir) : PORTILLA (7300 SAND)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 40901173 | 8 | 8/25/55 | 0 | 2014 |
| 40901679 | 6 | 3/10/80 | 1100 | 1990 |
| 40901712 | 4 | 9/18/69 | 900 | 4700 |
| 40901713 | 8 | 9/30/73 | 0 | 4705 |
| 40901715 | 4 | 9/26/72 | 1100 | 4690 |
| 40904119 | 7 | 7/ 8/71 | 0 | 1600 |
| 40901694 | 3 | 0/ 0/ 0 | 900 | 1000 |
| 40901707 | 7 | 0/ 0/ 0 | 0 | 4735 |
| 40901671 | 3 | 1/ 8/79 | 0 | 3300 |
| 40901688 | 3 | 7/ 9/80 | 950 | 4800 |
| 40901682 | 3 | 9/11/80 | 1170 | 4700 |
| 40901692 | 7 | 0/ 0/ 0 | 0 | 4700 |
| 40901654 | 3 | 0/ 0/ 0 | 0 | 4700 |
| 40901664 | 3 | 0/ 0/ 0 | 0 | 4680 |
| 40901678 | 3 | 5/14/85 | 0 | 4750 |
| 40901178 | 3 | 0/ 0/ 0 | 0 | 4746 |
| 40901666 | 3 | 0/ 0/ 0 | 0 | 4700 |

Selected Injection Well Data from the Texas RRC UIC Database

County : SAN PATRICIO
Field (Reservoir) : SINTON WEST (SHALLOW)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 40900423 | 8 | 3/29/73 | 1050 | 1675 |
| 40900719 | 7 | 6/13/74 | 0 | 2041 |
| 40900720 | 7 | 6/13/74 | 0 | 1458 |
| 40900724 | 8 | 2/25/74 | 0 | 1570 |
| 40900518 | 7 | 7/24/75 | 0 | 1560 |
| 40900546 | 7 | 0/ 0/ 0 | 0 | 1830 |
| 40900629 | 8 | 0/ 0/ 0 | 0 | 1110 |
| 40981490 | 2 | 0/ 0/ 0 | 0 | 0 |
| 40932247 | 3 | 7/ 6/88 | 1000 | 3770 |
| 40932210 | 3 | 11/28/88 | 900 | 1484 |
| 40981000 | 4 | 11/ 2/89 | 850 | 1920 |
| 40931861 | 3 | 10/31/91 | 1050 | 2518 |
| 40980537 | 3 | 12/ 9/92 | 900 | 3085 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : SAN PATRICIO
Field (Reservoir) : TAFT (4000)
Field (Reservoir) : TAFT (4550)
Field (Reservoir) : TAFT (3700 CATAHOULA)
Field (Reservoir) : TAFT (4900)
Field (Reservoir) : TAFT (4300)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 40901354 | 3 | 11/12/73 | 600 | 3507 |
| 40901330 | 3 | 1/18/71 | 550 | 3495 |
| 40901355 | 3 | 1/18/71 | 600 | 3490 |
| 40901367 | 3 | 2/15/72 | 550 | 4200 |
| 40901365 | 3 | 2/15/72 | 550 | 4200 |
| 40901366 | 3 | 2/15/72 | 550 | 4200 |
| 40901401 | 7 | 1/ 1/ 1 | 550 | 0 |
| 40981039 | 7 | 0/ 0/ 0 | 550 | 3050 |
| 40901297 | 6 | 11/22/72 | 550 | 3728 |
| 40901316 | 7 | 3/25/73 | 550 | 4475 |
| 40901308 | 7 | 8/11/72 | 0 | 4041 |
| 40901417 | 8 | 2/21/73 | 500 | 4045 |
| 40901316 | 7 | 1/23/73 | 550 | 0 |
| 40904351 | 7 | 1/23/73 | 0 | 0 |
| 40901307 | 7 | 1/23/73 | 0 | 0 |
| 40901998 | 6 | 2/26/73 | 750 | 4130 |
| 40901999 | 4 | 2/26/73 | 750 | 4130 |
| 40901342 | 3 | 3/18/68 | 600 | 3475 |
| 40901329 | 8 | 0/ 0/ 0 | 600 | 3500 |
| 40981024 | 8 | 4/ 9/65 | 600 | 1360 |
| 40901353 | 7 | 5/18/52 | 0 | 0 |
| 40904120 | 8 | 3/16/81 | 500 | 4030 |
| 40901325 | 4 | 1/10/83 | 500 | 3470 |
| 40901335 | 7 | 0/ 0/ 0 | 0 | 4624 |
| 40901312 | 6 | 10/17/75 | 550 | 3780 |
| 40981044 | 3 | 5/15/80 | 550 | 4356 |
| 40901326 | 7 | 0/ 0/ 0 | 0 | 3540 |
| 40901404 | 8 | 2/ 1/73 | 550 | 3997 |
| 40901416 | 7 | 0/ 0/ 0 | 0 | 3992 |
| 40903935 | 2 | 5/10/88 | 500 | 3920 |
| 40903935 | 2 | 5/10/88 | 500 | 3920 |
| 40981021 | 3 | 2/23/89 | 500 | 3800 |
| 40901370 | 7 | 2/15/72 | 550 | 4200 |
| 40932055 | 3 | 6/16/89 | 550 | 3940 |
| 40981021 | 6 | 2/23/89 | 550 | 3800 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : SAN PATRICIO
Field (Reservoir) : WHITE POINT EAST
Field (Reservoir) : WHITE POINT EAST (2300)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 40903150 | 8 | 8/ 6/73 | 0 | 3670 |
| 40981667 | 8 | 8/22/69 | 150 | 1260 |
| 40903314 | 8 | 0/ 0/ 0 | 0 | 4155 |
| 40903105 | 3 | 3/31/93 | 250 | 1275 |
| 40903092 | 3 | 11/ 5/93 | 300 | 1350 |
| 40903187 | 2 | 12/15/93 | 300 | 4364 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : STARR
Field (Reservoir) : GARCIA
Field (Reservoir) : GARCIA (MILLER -B- VI)
Field (Reservoir) : GARCIA (MILLER -C- 1)
Field (Reservoir) : GARCIA (3150)
Field (Reservoir) : GARCIA (FROST -A-)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 42704218 | 4 | 10/14/70 | 250 | 3732 |
| 42704223 | 3 | 8/ 1/74 | 250 | 3727 |
| 42704224 | 8 | 0/ 0/ 0 | 0 | 0 |
| 42704235 | 3 | 3/ 4/75 | 250 | 3719 |
| 42704471 | 8 | 0/ 0/ 0 | 0 | 0 |
| 42703881 | 8 | 0/ 0/ 0 | 0 | 0 |
| 42704266 | 4 | 4/13/70 | 0 | 3149 |
| 42704227 | 8 | 0/ 0/ 0 | 0 | 0 |
| 42704234 | 7 | 0/ 0/ 0 | 0 | 0 |
| 42780214 | 3 | 12/27/71 | 250 | 3733 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : STARR
Field (Reservoir) : JAY SIMMONS
Field (Reservoir) : JAY SIMMONS (A)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 42700398 | 6 | 0/ 0/ 0 | 0 | 0 |
| 42700304 | 6 | 6/17/80 | 1500 | 6475 |
| 42700418 | 6 | 3/11/81 | 1500 | 6405 |
| 42700392 | 8 | 0/ 0/ 0 | 0 | 6400 |
| 42700390 | 3 | 12/14/64 | 1500 | 6112 |
| 42700388 | 6 | 0/ 0/ 0 | 0 | 5778 |
| 42700397 | 6 | 6/26/68 | 1000 | 5778 |
| 42700393 | 4 | 9/ 4/87 | 1450 | 4268 |
| 42700389 | 6 | 8/19/64 | 1500 | 5771 |
| 42700396 | 6 | 8/19/64 | 1500 | 5738 |
| 42700400 | 6 | 10/30/67 | 1500 | 5735 |
| 42700403 | 6 | 12/14/64 | 0 | 6000 |
| 42700000 | 3 | 0/ 0/ 0 | 1450 | 6050 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : STARR
Field (Reservoir) : KELSEY SOUTH (ZONE 19-B S)
Field (Reservoir) : KELSEY SOUTH (ZONE 20-A S)
Field (Reservoir) : KELSEY SOUTH (CLARK UP.)
Field (Reservoir) : KELSEY SOUTH (ZONE 16-A)
Field (Reservoir) : KELSEY SOUTH (ZONE 19-B)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 42700261 | 8 | 10/11/61 | 1500 | 6020 |
| 42700262 | 7 | 10/11/61 | 0 | 0 |
| 42704959 | 6 | 10/11/61 | 0 | 0 |
| 42730141 | 7 | 12/15/70 | 1500 | 5998 |
| 42700310 | 8 | 3/15/65 | 0 | 5956 |
| 42780043 | 4 | 10/25/66 | 1425 | 5609 |
| 42704513 | 2 | 8/ 6/85 | 0 | 5240 |
| 42700000 | 7 | 10/11/61 | 1500 | 5999 |
| 42700230 | 3 | 3/ 6/92 | 1500 | 5700 |

Selected Injection Well Data from the Texas RRC UIC Database

County : STARR
Field (Reservoir) : REYNA (HOCKLEY SAND)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 42702368 | 7 | 9/24/70 | 100 | 670 |
| 42702418 | 5 | 12/16/68 | 200 | 670 |
| 42702415 | 5 | 7/30/63 | 200 | 649 |
| 42702417 | 5 | 12/16/68 | 200 | 662 |
| 42702371 | 5 | 12/14/88 | 400 | 673 |

Selected Injection Well Data from the Texas RRC UIC Database

County : STARR
Field (Reservoir) : RICABY

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 42702948 | 3 | 10/26/78 | 250 | 1375 |
| 42702949 | 4 | 10/26/78 | 250 | 1370 |
| 42702954 | 3 | 10/26/78 | 250 | 1381 |
| 42702941 | 3 | 10/26/78 | 250 | 1367 |
| 42702963 | 6 | 8/21/69 | 0 | 0 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : STARR
Field (Reservoir) : RINCON
Field (Reservoir) : RINCON (VICKSBURG SAND)
Field (Reservoir) : RINCON (H)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 42701543 | 7 | 8/ 7/73 | 0 | 4212 |
| 42703548 | 8 | 11/23/62 | 0 | 0 |
| 42701518 | 7 | 2/11/75 | 0 | 0 |
| 42701607 | 8 | 7/ 6/72 | 0 | 0 |
| 42701595 | 5 | 7/ 6/72 | 450 | 4500 |
| 42730164 | 8 | 2/11/75 | 500 | 3836 |
| 42701583 | 8 | 3/ 1/72 | 350 | 3935 |
| 42730124 | 7 | 12/ 9/75 | 350 | 3860 |
| 42701582 | 8 | 1/17/73 | 500 | 3874 |
| 42781482 | 7 | 0/ 0/ 0 | 0 | 0 |
| 42781158 | 7 | 0/ 0/ 0 | 0 | 0 |
| 42781160 | 7 | 0/ 0/ 0 | 0 | 0 |
| 42701567 | 7 | 0/ 0/ 0 | 0 | 0 |
| 42701609 | 8 | 10/24/72 | 450 | 3872 |
| 42781177 | 7 | 0/ 0/ 0 | 0 | 0 |
| 42781181 | 7 | 2/14/77 | 0 | 0 |
| 42701716 | 7 | 0/ 0/ 0 | 0 | 0 |
| 42730386 | 7 | 0/ 0/ 0 | 0 | 0 |
| 42781185 | 7 | 0/ 0/ 0 | 0 | 0 |
| 42781186 | 7 | 0/ 0/ 0 | 0 | 0 |
| 42781187 | 7 | 0/ 0/ 0 | 0 | 0 |
| 42701476 | 7 | 0/ 0/ 0 | 0 | 0 |
| 42701617 | 7 | 2/14/77 | 0 | 0 |
| 42701581 | 7 | 0/ 0/ 0 | 0 | 0 |
| 42701613 | 7 | 0/ 0/ 0 | 0 | 0 |
| 42701472 | 8 | 2/14/77 | 0 | 3837 |
| 42781447 | 8 | 7/22/69 | 0 | 0 |
| 42701616 | 8 | 12/ 1/64 | 450 | 4174 |
| 42701589 | 8 | 11/25/87 | 500 | 3800 |
| 42780982 | 7 | 6/12/73 | 450 | 3924 |
| 42701467 | 8 | 12/28/64 | 450 | 4040 |
| 42701468 | 8 | 12/28/64 | 450 | 4050 |
| 42701477 | 8 | 12/28/64 | 450 | 4095 |
| 42701480 | 8 | 12/28/64 | 450 | 4102 |
| 42701481 | 8 | 12/28/64 | 450 | 4066 |
| 42700000 | 7 | 12/28/64 | 450 | 4128 |
| 42701485 | 8 | 12/28/64 | 450 | 3654 |
| 42701487 | 8 | 12/28/64 | 450 | 4195 |
| 42700000 | 7 | 12/28/64 | 500 | 4042 |
| 42701513 | 7 | 12/28/64 | 500 | 4030 |
| 42701461 | 8 | 12/28/64 | 500 | 4073 |
| 42701516 | 7 | 12/28/64 | 500 | 4044 |
| 42701565 | 7 | 12/28/64 | 0 | 4090 |
| 42701603 | 8 | 12/28/64 | 450 | 4080 |
| 42701520 | 6 | 2/15/84 | 450 | 3704 |
| 42703553 | 8 | 10/ 7/63 | 450 | 3970 |
| 42701604 | 8 | 12/28/64 | 450 | 4042 |
| 42700000 | 7 | 12/28/64 | 450 | 4196 |
| 42701612 | 7 | 12/28/64 | 450 | 4143 |

| | | | | |
|---|---|---|---|---|
| 42700000 | 7 | 12/28/64 | 450 | 4140 |
| 42701594 | 8 | 12/28/64 | 450 | 4095 |
| 42701597 | 8 | 12/28/64 | 400 | 4026 |
| 42781237 | 7 | 12/28/64 | 350 | 4070 |
| 42703551 | 7 | 7/29/68 | 450 | 3660 |
| 42700000 | 7 | 11/ 4/65 | 500 | 4026 |
| 42700000 | 7 | 8/29/66 | 500 | 3990 |
| 42701542 | 3 | 6/30/89 | 350 | 1680 |
| 42701541 | 8 | 8/24/73 | 450 | 4212 |
| 42704736 | 3 | 12/ 5/85 | 550 | 4680 |
| 42701570 | 3 | 5/27/93 | 450 | 3745 |
| 42732615 | 2 | 6/30/94 | 350 | 3890 |

## Selected Injection Well Data from the Texas RRC UIC Database

County : STARR
Field (Reservoir) : SUN
Field (Reservoir) : SUN (F-1-M 4950)
Field (Reservoir) : SUN (F-2 LO. NW.)
Field (Reservoir) : SUN (D-1)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 42704897 | 8 | 6/ 1/69 | 0 | 0 |
| 42704922 | 8 | 6/ 1/69 | 0 | 0 |
| 42700687 | 8 | 0/ 0/ 0 | 0 | 4195 |
| 42700695 | 8 | 12/15/70 | 0 | 5083 |
| 42700606 | 8 | 3/27/72 | 1200 | 4850 |
| 42730364 | 8 | 7/31/72 | 200 | 4994 |
| 42700893 | 7 | 6/ 1/69 | 0 | 0 |
| 42730170 | 4 | 12/28/70 | 1050 | 4856 |
| 42700610 | 4 | 10/ 5/81 | 1200 | 3856 |
| 42700691 | 3 | 0/ 0/ 0 | 0 | 4619 |
| 42731560 | 8 | 1/26/82 | 0 | 3990 |
| 42731621 | 3 | 1/ 7/87 | 1000 | 3835 |
| 42700699 | 4 | 6/25/87 | 950 | 3830 |
| 42700703 | 8 | 2/19/88 | 950 | 4615 |
| 42700708 | 8 | 2/19/88 | 950 | 4628 |
| 42730743 | 3 | 2/19/88 | 950 | 4555 |
| 42700567 | 7 | 8/17/94 | 1050 | 4856 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : STARR
Field (Reservoir) : SUN NORTH
Field (Reservoir) : SUN NORTH (BURRITO)
Field (Reservoir) : SUN NORTH (5800)
Field (Reservoir) : SUN NORTH (F-3-G)
Field (Reservoir) : SUN NORTH (WAHEAH)
Field (Reservoir) : SUN NORTH (5200 SAND)
Field (Reservoir) : SUN NORTH (D-2-G)
Field (Reservoir) : SUN NORTH (JEWEL)
Field (Reservoir) : SUN NORTH (C-3-B)
Field (Reservoir) : SUN NORTH (D-3-D)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 42780733 | 8 | 0/ 0/ 0 | 0 | 3306 |
| 42780733 | 8 | 7/16/80 | 1200 | 3306 |
| 42700562 | 7 | 9/29/75 | 0 | 0 |
| 42700888 | 8 | 12/13/65 | 0 | 0 |
| 42700582 | 7 | 12/14/65 | 0 | 0 |
| 42700910 | 8 | 0/ 0/ 0 | 0 | 0 |
| 42700906 | 8 | 11/26/68 | 0 | 0 |
| 42700949 | 7 | 4/20/72 | 1200 | 5180 |
| 42700580 | 8 | 2/15/80 | 0 | 4320 |
| 42700923 | 7 | 0/ 0/ 0 | 0 | 5027 |
| 42700600 | 3 | 0/ 0/ 0 | 0 | 4346 |
| 42700609 | 4 | 0/ 0/ 0 | 0 | 3874 |
| 42780736 | 8 | 8/18/87 | 1000 | 4803 |
| 42700911 | 8 | 0/ 0/ 0 | 1200 | 4955 |
| 42700913 | 8 | 0/ 0/ 0 | 1200 | 4950 |
| 42700914 | 8 | 0/ 0/ 0 | 1200 | 4961 |
| 42700915 | 7 | 0/ 0/ 0 | 1200 | 4938 |
| 42700925 | 7 | 0/ 0/ 0 | 1200 | 4970 |
| 42700920 | 7 | 0/ 0/ 0 | 1200 | 4954 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : VICTORIA
Field (Reservoir) : BLOOMINGTON (4600)
Field (Reservoir) : BLOOMINGTON (6100)
Field (Reservoir) : BLOOMINGTON (GRETA STRINGER)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 46901992 | 7 | 0/ 0/ 0 | 0 | 0 |
| 46980587 | 6 | 0/ 0/ 0 | 0 | 4150 |
| 46901999 | 8 | 0/ 0/ 0 | 0 | 0 |
| 46901997 | 8 | 6/23/78 | 1700 | 3380 |
| 46902003 | 8 | 0/ 0/ 0 | 0 | 3400 |
| 46902023 | 8 | 9/ 3/75 | 1600 | 3400 |
| 46902041 | 8 | 8/28/75 | 1700 | 3300 |
| 46902049 | 8 | 3/ 3/77 | 2000 | 3300 |
| 46902139 | 8 | 12/ 3/79 | 1000 | 4760 |
| 46902129 | 4 | 9/ 6/62 | 1850 | 4000 |
| 46902106 | 4 | 3/20/61 | 1870 | 4205 |
| 46902102 | 7 | 4/ 1/68 | 0 | 4185 |
| 46902110 | 4 | 2/21/74 | 1750 | 4180 |
| 46902054 | 8 | 5/16/69 | 0 | 3300 |
| 46980006 | 8 | 6/28/72 | 1700 | 3625 |
| 46902082 | 8 | 4/ 3/69 | 0 | 3880 |
| 46901991 | 3 | 3/ 3/77 | 2050 | 3380 |
| 46902135 | 7 | 0/ 0/ 0 | 0 | 0 |
| 46902144 | 7 | 0/ 0/ 0 | 1575 | 3430 |
| 46902073 | 8 | 10/29/68 | 2000 | 3370 |
| 46902109 | 3 | 4/20/83 | 0 | 4185 |
| 46902076 | 8 | 0/ 0/ 0 | 0 | 3590 |
| 46930236 | 3 | 3/ 2/93 | 1450 | 3930 |
| 46902085 | 1 | 12/31/93 | 1450 | 3460 |
| 46902122 | 0 | 11/ 3/92 | 1650 | 3480 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : VICTORIA
Field (Reservoir) : COLETTO CREEK
Field (Reservoir) : COLETTO CREEK (2800)
Field (Reservoir) : COLETTO CREEK (4700)
Field (Reservoir) : COLETTO CREEK (3500)
Field (Reservoir) : COLETTO CREEK (4650)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 46930103 | 7 | 8/10/79 | 0 | 2508 |
| 46901257 | 8 | 5/ 8/72 | 1550 | 3120 |
| 46901268 | 7 | 10/10/66 | 0 | 2487 |
| 46901600 | 7 | 0/ 0/ 0 | 0 | 1850 |
| 46901223 | 3 | 0/ 0/ 0 | 1560 | 2413 |
| 46901288 | 8 | 3/21/72 | 0 | 3100 |
| 46901243 | 3 | 6/29/62 | 1450 | 3260 |
| 46901257 | 8 | 0/ 0/ 0 | 0 | 0 |
| 46901258 | 3 | 4/27/64 | 1400 | 3120 |
| 46901250 | 4 | 5/25/64 | 500 | 3143 |
| 46901250 | 6 | 5/25/64 | 0 | 3180 |
| 46980009 | 6 | 0/ 0/ 0 | 0 | 3120 |
| 46980010 | 4 | 0/ 0/ 0 | 0 | 0 |
| 46900000 | 1 | 10/ 1/82 | 0 | 3100 |
| 46932009 | 6 | 4/ 1/83 | 0 | 3200 |
| 46932279 | 2 | 0/ 0/ 0 | 0 | 2882 |
| 46932009 | 3 | 0/ 0/ 0 | 0 | 2940 |
| 46901271 | 4 | 0/ 0/ 0 | 1350 | 2400 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : VICTORIA
Field (Reservoir) : HELEN GOHLKE ( WILCOX)
Field (Reservoir) : HELEN GOHLKE ( YEGUA K)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 46980613 | 5 | 5/18/72 | 0 | 2601 |
| 46900047 | 3 | 3/22/91 | 1250 | 3550 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : VICTORIA
Field (Reservoir) : HELEN GOHLKE W. (WILCOX)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 46900057 | 3 | 0/ 0/ 0 | 1850 | 2400 |
| 46903002 | 8 | 6/ 8/64 | 0 | 2452 |
| 46900048 | 3 | 8/19/81 | 1250 | 1920 |
| 46930448 | 2 | 8/ 1/88 | 1900 | 3880 |
| 46900064 | 7 | 8/ 1/88 | 1900 | 3910 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : VICTORIA
Field (Reservoir) : HEYSER
Field (Reservoir) : HEYSER (5400 #3)
Field (Reservoir) : HEYSER (5400 #2)
Field (Reservoir) : HEYSER (6700)
Field (Reservoir) : HEYSER (6450)
Field (Reservoir) : HEYSER (3900)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 46902519 | 8 | 0/ 0/ 0 | 1600 | 1992 |
| 46902537 | 8 | 12/10/75 | 1600 | 3631 |
| 46902441 | 7 | 4/ 4/62 | 0 | 4035 |
| 46902470 | 8 | 6/14/63 | 0 | 4048 |
| 46902472 | 4 | 7/25/66 | 0 | 4120 |
| 46902496 | 6 | 12/ 5/63 | 0 | 5370 |
| 46902553 | 8 | 0/ 0/ 0 | 0 | 4057 |
| 46931935 | 8 | 0/ 0/ 0 | 0 | 4900 |
| 46932005 | 3 | 0/ 0/ 0 | 0 | 4100 |
| 46902430 | 8 | 7/25/85 | 0 | 3735 |
| 46902538 | 3 | 3/21/88 | 1600 | 4970 |
| 46902536 | 3 | 11/29/89 | 1600 | 4945 |
| 46902521 | 4 | 12/11/89 | 1600 | 3975 |
| 46932853 | 3 | 9/13/91 | 1500 | 5450 |
| 46932844 | 3 | 2/ 4/92 | 1600 | 5442 |
| 46932836 | 3 | 6/ 7/91 | 1700 | 5470 |
| 46902465 | 4 | 3/19/91 | 1600 | 4000 |
| 46902469 | 3 | 3/11/91 | 1600 | 5349 |
| 46932836 | 6 | 11/ 3/93 | 1700 | 5570 |
| 46902476 | 2 | 3/18/94 | 1550 | 5467 |
| 46902477 | 3 | 3/18/94 | 1550 | 5479 |
| 46900000 | 0 | 3/19/91 | 1600 | 4000 |
| 46902460 | 0 | 3/11/91 | 1600 | 5350 |
| 46931670 | 0 | 3/11/91 | 1600 | 5368 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : VICTORIA
Field (Reservoir) : KEERAN
Field (Reservoir) : KEERAN (3900)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 46980626 | 6 | 7/24/74 | 0 | 3336 |
| 46902825 | 6 | 3/ 5/53 | 1250 | 3601 |
| 46902815 | 6 | 10/22/63 | 2100 | 3574 |
| 46900236 | 7 | 10/24/74 | 0 | 3712 |
| 46900217 | 3 | 0/ 0/ 0 | 2050 | 4875 |
| 46900219 | 6 | 0/ 0/ 0 | 0 | 4930 |
| 46900221 | 4 | 0/ 0/ 0 | 0 | 0 |
| 46981094 | 8 | 6/11/62 | 0 | 3630 |
| 46900746 | 3 | 10/23/90 | 2025 | 3400 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : VICTORIA
Field (Reservoir) : MCFADDIN (4400)
Field (Reservoir) : MCFADDIN (5000)
Field (Reservoir) : MCFADDIN (2200)
Field (Reservoir) : MCFADDIN (2800)
Field (Reservoir) : MCFADDIN (3600)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 46902251 | 8 | 5/16/49 | 1800 | 4535 |
| 46901574 | 3 | 7/12/49 | 1775 | 4600 |
| 46901577 | 3 | 8/ 5/52 | 1100 | 4413 |
| 46902222 | 6 | 5/19/69 | 0 | 3740 |
| 46902229 | 3 | 10/ 9/69 | 1800 | 4413 |
| 46902277 | 8 | 8/23/65 | 1800 | 4600 |
| 46902278 | 7 | 10/ 5/48 | 0 | 4500 |
| 46980857 | 8 | 2/ 4/57 | 1100 | 4480 |
| 46902225 | 4 | 5/26/71 | 1800 | 4403 |
| 46902221 | 3 | 7/12/82 | 0 | 3600 |
| 46902207 | 3 | 3/24/83 | 0 | 3600 |
| 46902245 | 3 | 0/ 0/ 0 | 0 | 3715 |
| 46932291 | 6 | 0/ 0/ 0 | 0 | 4375 |
| 46980724 | 3 | 1/23/89 | 1800 | 3605 |
| 46902212 | 3 | 6/25/93 | 1650 | 3602 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : VICTORIA
Field (Reservoir) : PLACEDO
Field (Reservoir) : PLACEDO (4250)
Field (Reservoir) : PLACEDO (5770)
Field (Reservoir) : PLACEDO (4700)
Field (Reservoir) : PLACEDO (4000 CATAHOULA)
Field (Reservoir) : PLACEDO (4150 CATAHOULA)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 46902633 | 8 | 10/ 2/78 | 1400 | 4050 |
| 46902630 | 8 | 7/21/75 | 2000 | 4165 |
| 46902621 | 3 | 1/21/64 | 850 | 3500 |
| 46901816 | 3 | 1/ 6/69 | 1600 | 4900 |
| 46901848 | 7 | 0/ 0/ 0 | 0 | 4150 |
| 46901914 | 4 | 7/30/51 | 1200 | 4890 |
| 46902649 | 8 | 10/25/76 | 0 | 3605 |
| 46902565 | 8 | 3/23/83 | 0 | 3520 |
| 46900000 | 4 | 2/18/83 | 0 | 0 |
| 46902643 | 4 | 0/ 0/ 0 | 0 | 4930 |
| 46901897 | 8 | 11/16/64 | 0 | 4180 |
| 46900000 | 3 | 5/12/77 | 1450 | 1954 |
| 46931608 | 7 | 0/ 0/ 0 | 0 | 4834 |
| 46980644 | 3 | 5/30/57 | 1400 | 4915 |
| 46902578 | 3 | 0/ 0/ 0 | 0 | 4910 |
| 46902804 | 6 | 7/11/61 | 0 | 3500 |
| 46901825 | 3 | 11/20/86 | 1450 | 2100 |
| 46901906 | 3 | 0/ 0/ 0 | 1500 | 4050 |
| 46931828 | 3 | 10/16/87 | 1450 | 4790 |
| 46930618 | 7 | 0/ 0/ 0 | 1450 | 3950 |
| 46901831 | 5 | 3/17/89 | 1525 | 3235 |
| 46902564 | 3 | 4/25/90 | 1450 | 3970 |
| 46902640 | 3 | 0/ 0/ 0 | 1550 | 4700 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : VICTORIA
Field (Reservoir) : PLACEDO EAST
Field (Reservoir) : PLACEDO EAST (5500)
Field (Reservoir) : PLACEDO EAST (6050 SD.)

| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 46902752 | 4 | 0/ 0/ 0 | 0 | 4030 |
| 46902759 | 7 | 6/16/67 | 0 | 4065 |
| 46902756 | 8 | 6/14/63 | 0 | 3610 |
| 46902729 | 3 | 3/27/75 | 0 | 2350 |
| 46902751 | 7 | 5/31/49 | 0 | 4050 |
| 46902746 | 8 | 0/ 0/ 0 | 0 | 4760 |
| 46900000 | 6 | 0/ 0/ 0 | 0 | 4970 |
| 46902746 | 8 | 4/ 4/84 | 0 | 4025 |
| 46902750 | 3 | 0/ 0/ 0 | 0 | 4030 |
| 46902759 | 8 | 6/16/67 | 0 | 4810 |

Selected Injection Well Data from the
Texas RRC UIC Database

County : VICTORIA
Field (Reservoir) : PRIDHAM LAKE
Field (Reservoir) : PRIDHAM LAKE (CATAHOULA)
Field (Reservoir) : PRIDHAM LAKE (OAKVILLE)
Field (Reservoir) : PRIDHAM LAKE (TYNG)
Field (Reservoir) : PRIDHAM LAKE (3800)
Field (Reservoir) : PRIDHAM LAKE (3900)
Field (Reservoir) : PRIDHAM LAKE (1560)

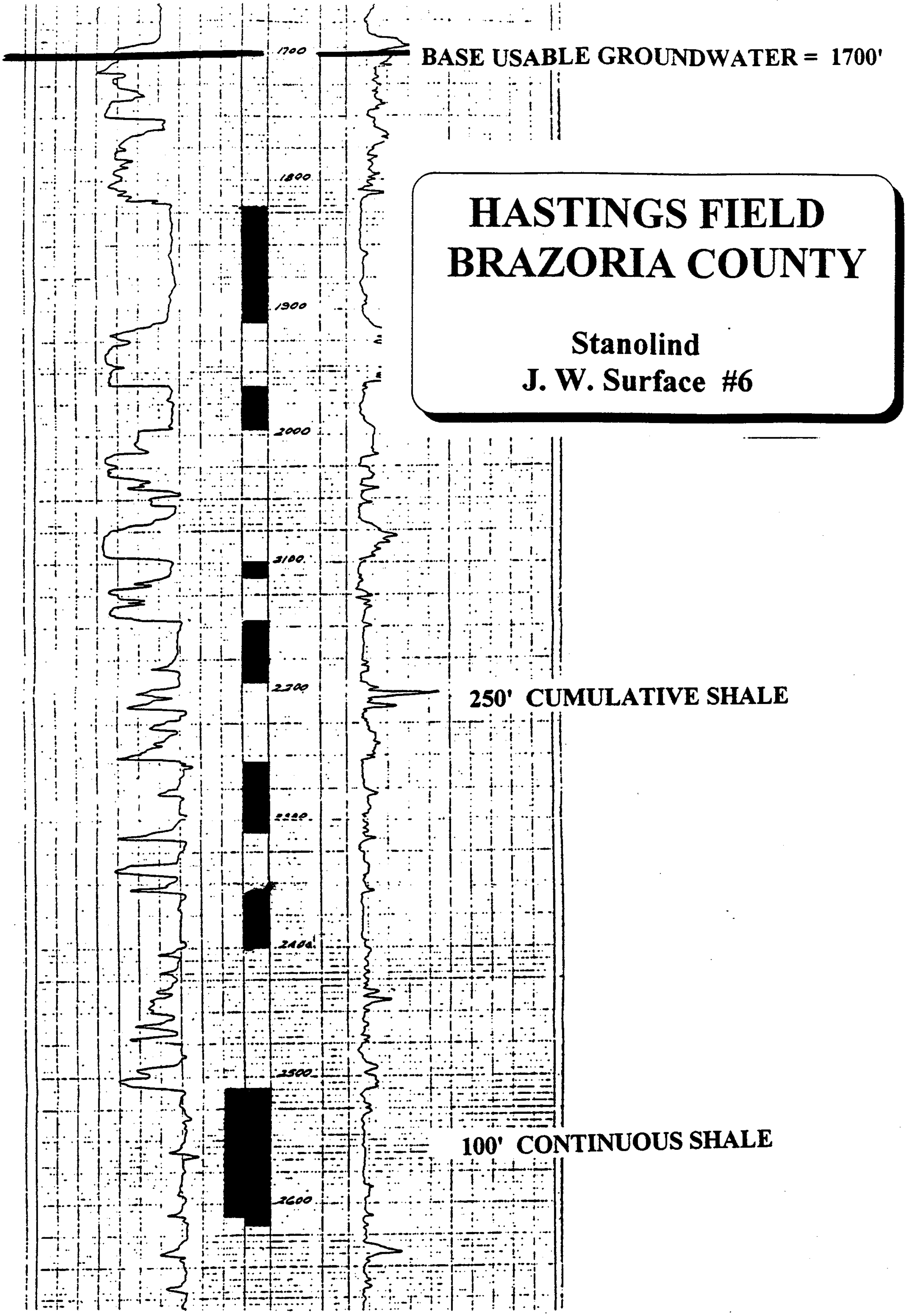
| API # | H-10 Status | Auth. Date | Base UQW | Top of Inj. Zone |
|---|---|---|---|---|
| 46901024 | 7 | 3/28/78 | 1650 | 3000 |
| 46980858 | 8 | 7/21/76 | 1800 | 3300 |
| 46901036 | 7 | 5/16/68 | 0 | 4747 |
| 46930244 | 4 | 8/ 3/77 | 1650 | 3000 |
| 46930290 | 8 | 2/ 1/80 | 0 | 1728 |
| 46901036 | 8 | 5/17/68 | 0 | 4747 |
| 46980340 | 7 | 5/26/76 | 0 | 2468 |
| 46901107 | 7 | 10/ 2/74 | 0 | 2064 |
| 46980088 | 3 | 5/ 5/69 | 0 | 1960 |
| 46901035 | 3 | 12/22/80 | 1650 | 3000 |
| 46901033 | 7 | 0/ 0/ 0 | 0 | 0 |
| 46931721 | 6 | 0/ 0/ 0 | 0 | 0 |
| 46931717 | 8 | 0/ 0/ 0 | 0 | 0 |
| 46901019 | 4 | 0/ 0/ 0 | 0 | 2580 |
| 46930534 | 3 | 2/ 3/88 | 1675 | 2600 |
| 46931721 | 3 | 0/ 0/ 0 | 1525 | 3305 |
| 46931885 | 8 | 5/23/91 | 1500 | 2640 |
| 46932793 | 3 | 4/10/92 | 1425 | 3054 |

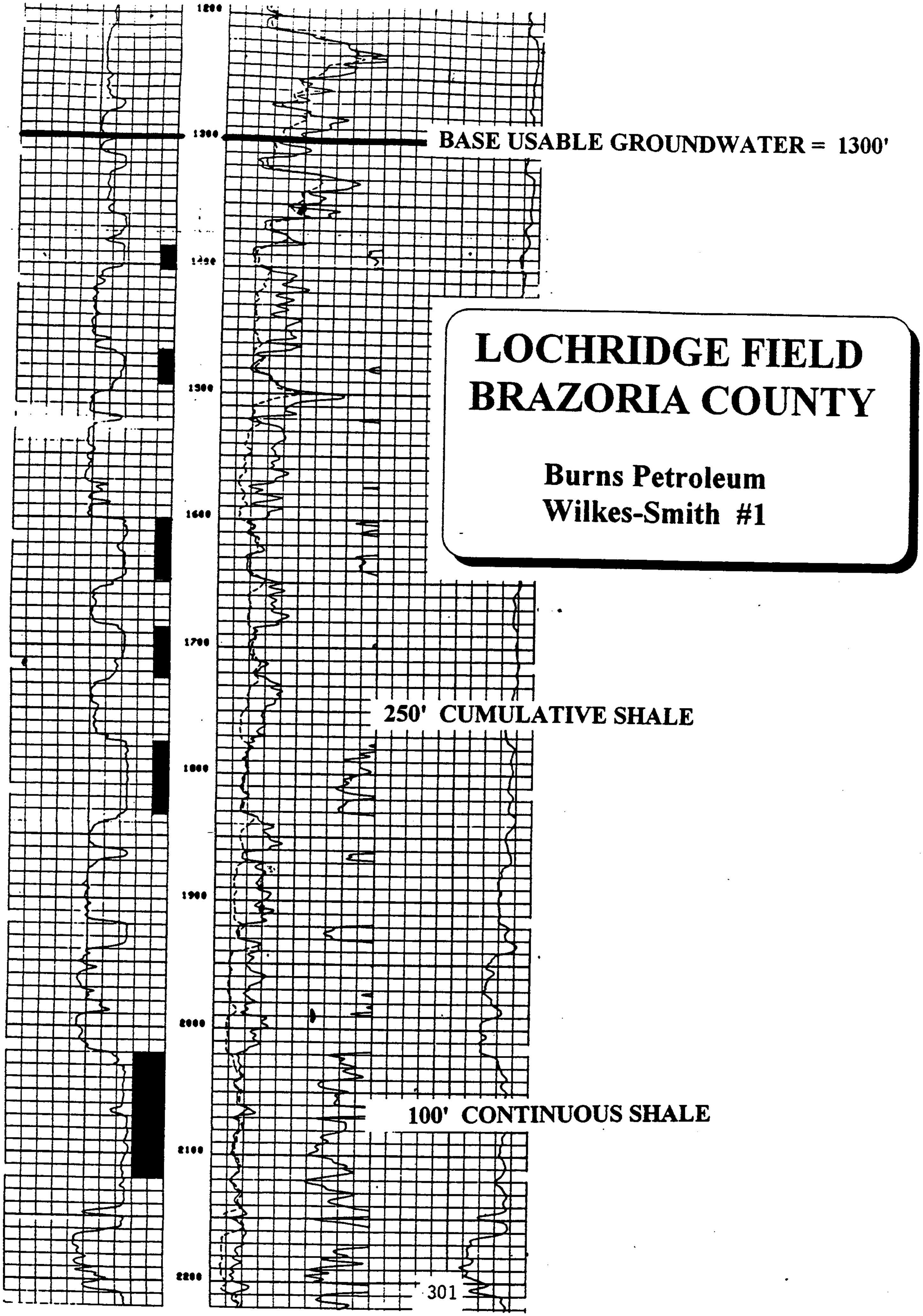
## APPENDIX 2

Copies of portions of borehole logs from Texas Gulf Coast study fields showing 250 foot cumulative and 100 foot continuous shale intervals as interpreted from the logs.

Base of usable quality groundwater from Appendix 1.

Shallow salt domes oilfields are excluded from analysis.

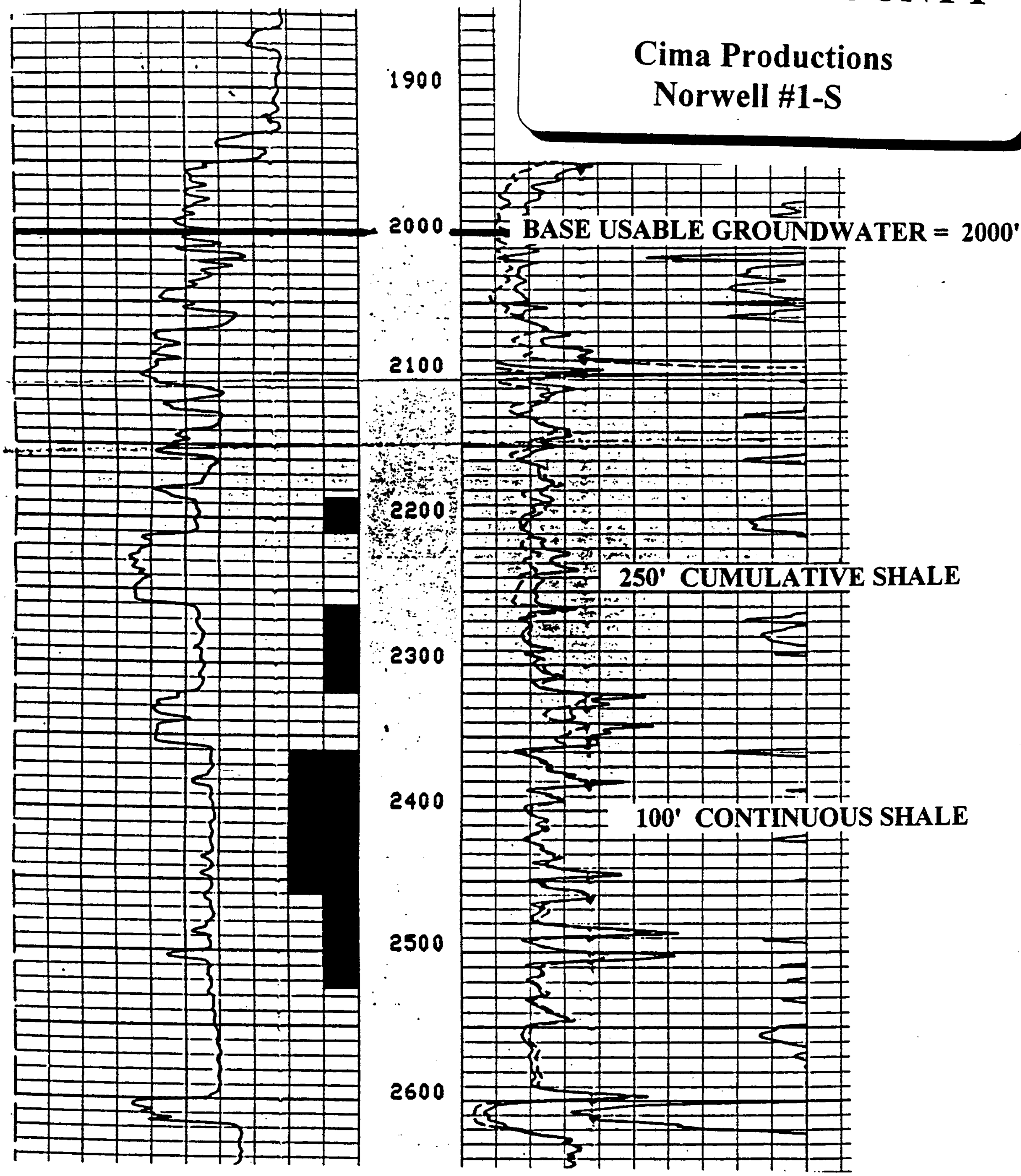

BASE USABLE GROUNDWATER = 1700'
HASTINGS FIELD
BRAZORIA COUNTY
Stanolind
J. W. Surface #6
250' CUMULATIVE SHALE
100' CONTINUOUS SHALE



BASE USABLE GROUNDWATER = 1300'
LOCHRIDGE FIELD
BRAZORIA COUNTY
Burns Petroleum
Wilkes-Smith #1
250' CUMULATIVE SHALE
100' CONTINUOUS SHALE

# MANVEL FIELD
# BRAZORIA COUNTY

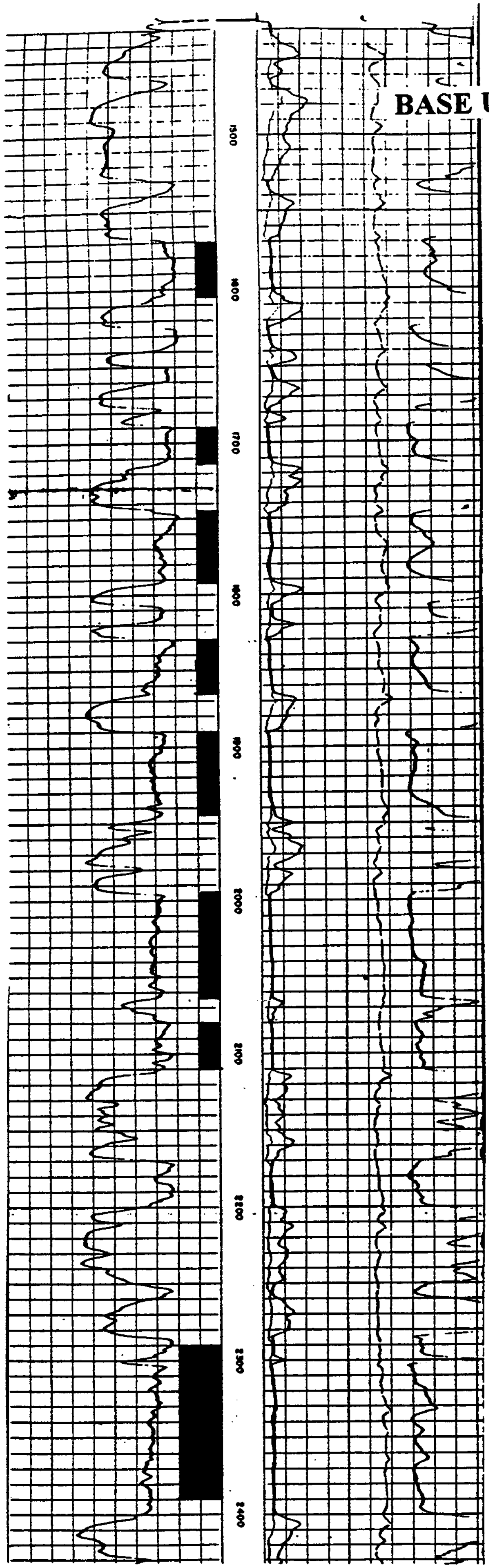
**Cima Productions**
**Norwell #1-S**



BASE USABLE GROUNDWATER = 1200'

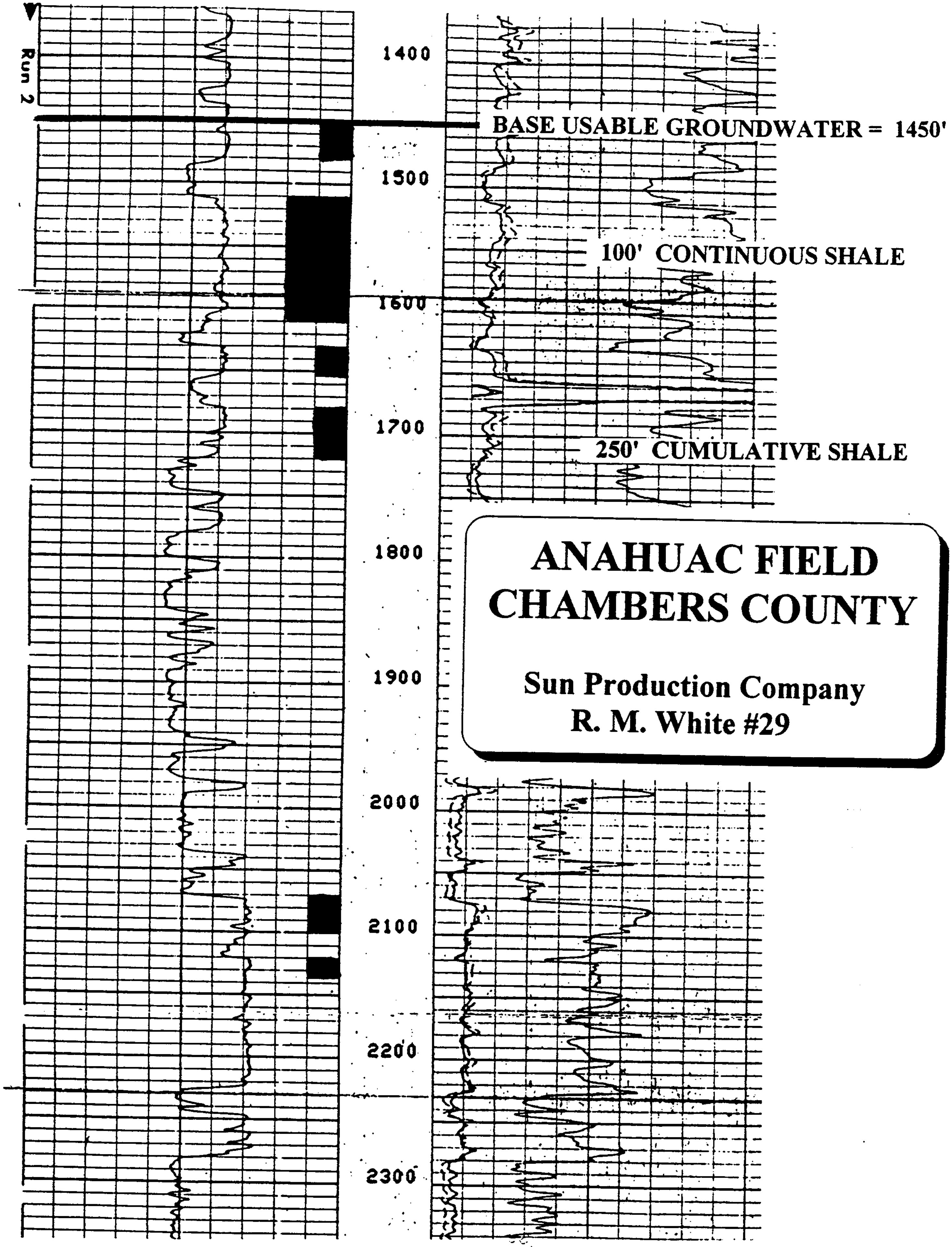
# OLD OCEAN FIELD
# BRAZORIA COUNTY

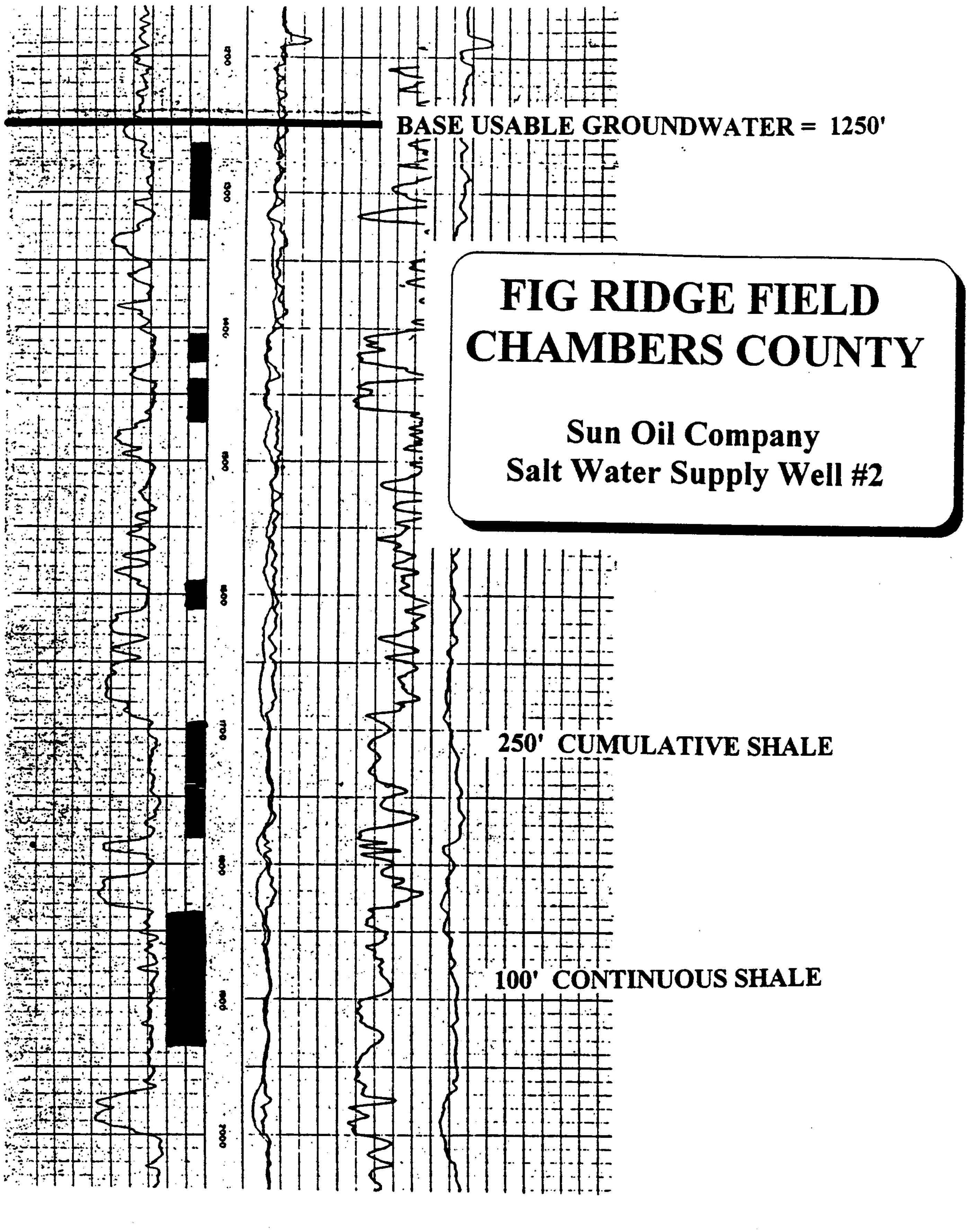
## La Gloria Corporation
## San Bernard River-State #1



250' CUMULATIVE SHALE

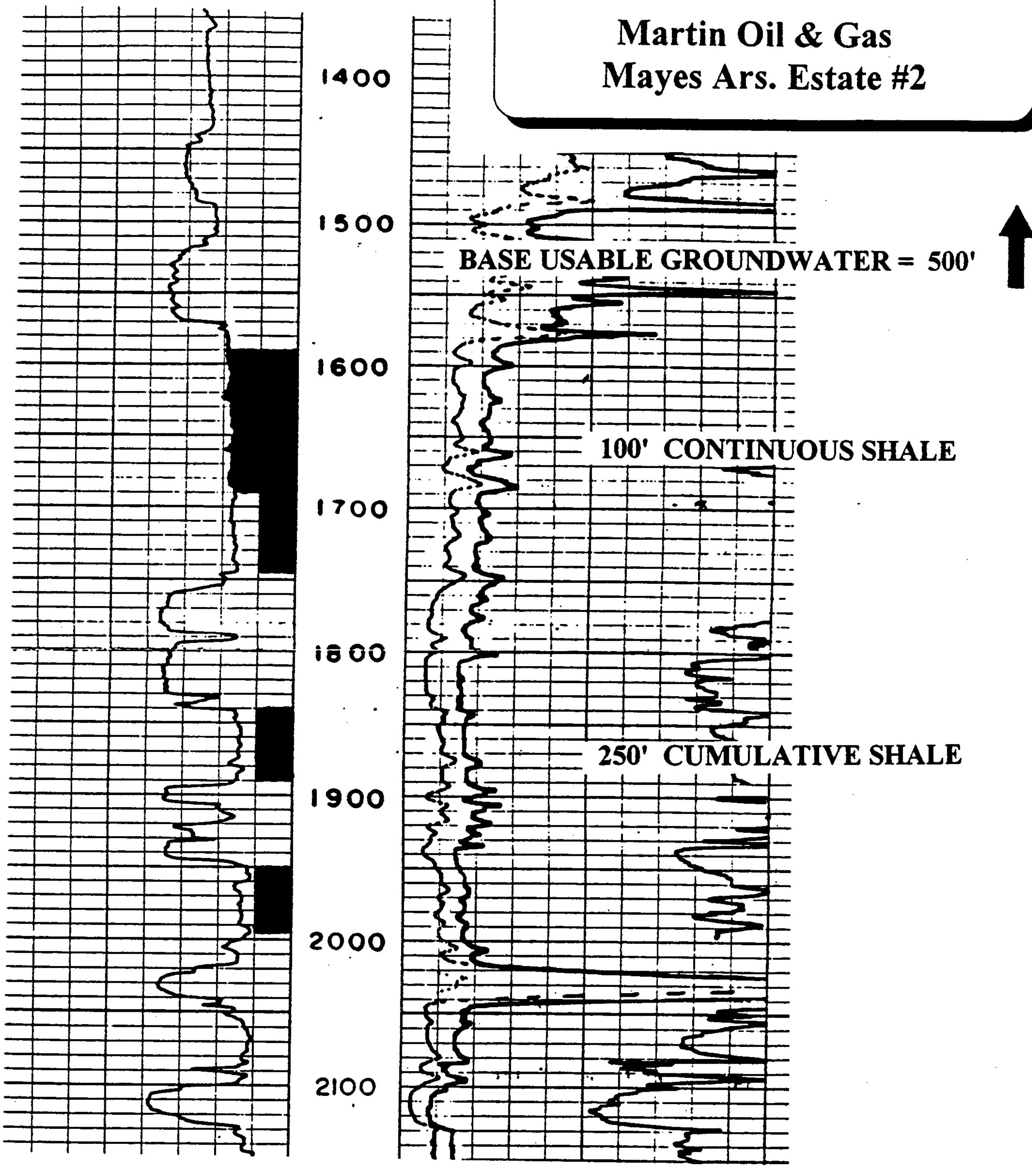
100' CONTINUOUS SHALE

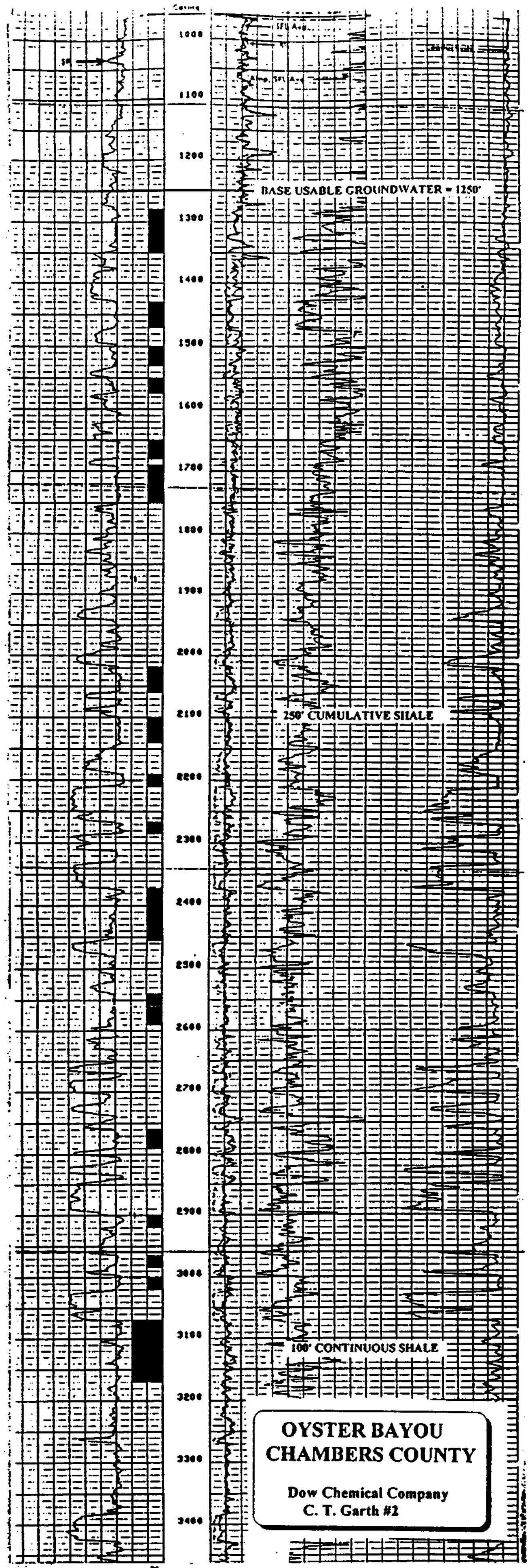

Run 2
1400
BASE USABLE GROUNDWATER = 1450'
1500
100' CONTINUOUS SHALE
1600
1700
250' CUMULATIVE SHALE
1800
ANAHUAC FIELD
CHAMBERS COUNTY
Sun Production Company
R. M. White #29
1900
2000
2100
2200
2300


BASE USABLE GROUNDWATER = 1250'
FIG RIDGE FIELD
CHAMBERS COUNTY
Sun Oil Company
Salt Water Supply Well #2
250' CUMULATIVE SHALE
100' CONTINUOUS SHALE

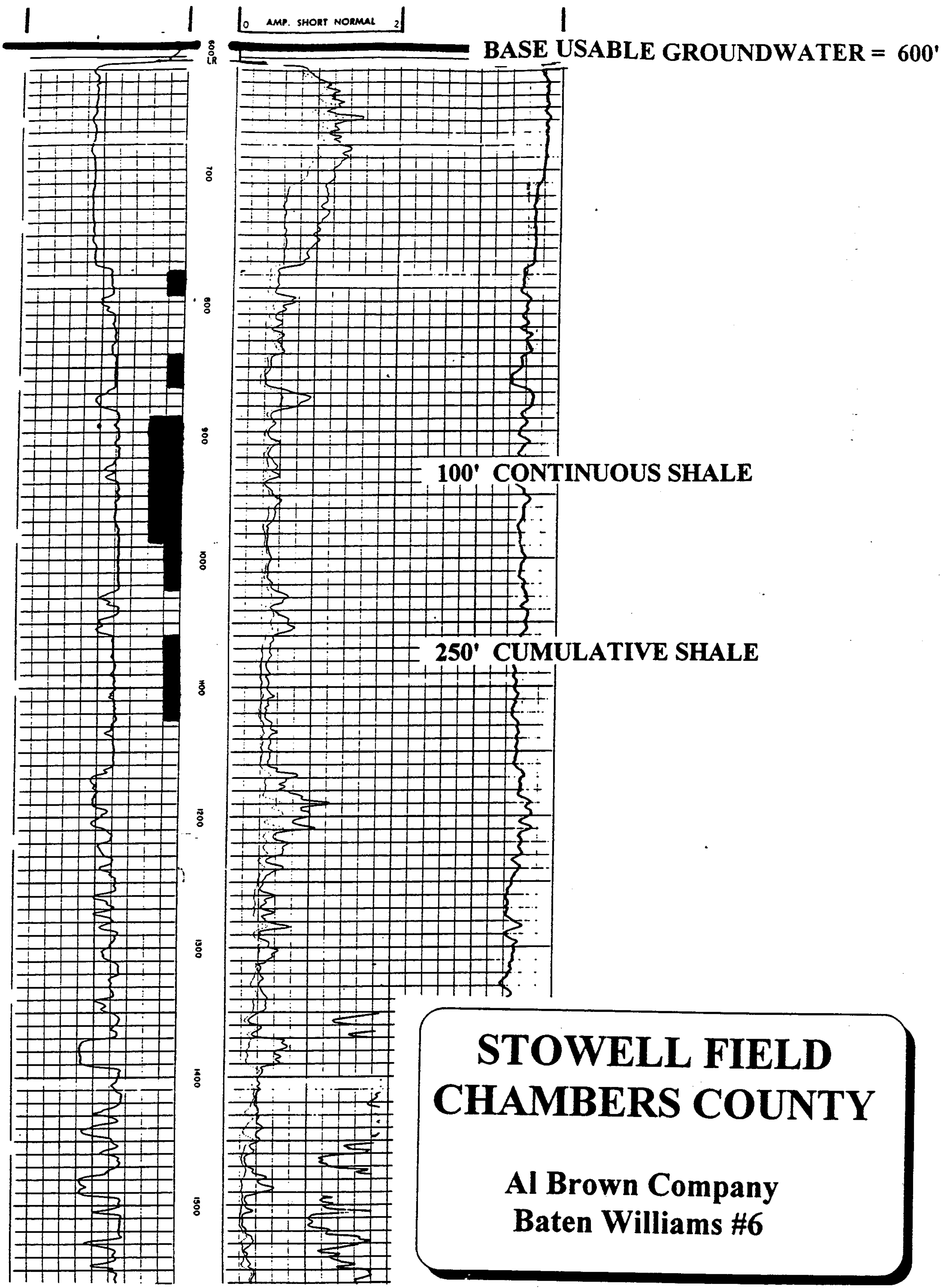
# LOST LAKE FIELD
# CHAMBERS COUNTY

**Martin Oil & Gas**
**Mayes Ars. Estate #2**



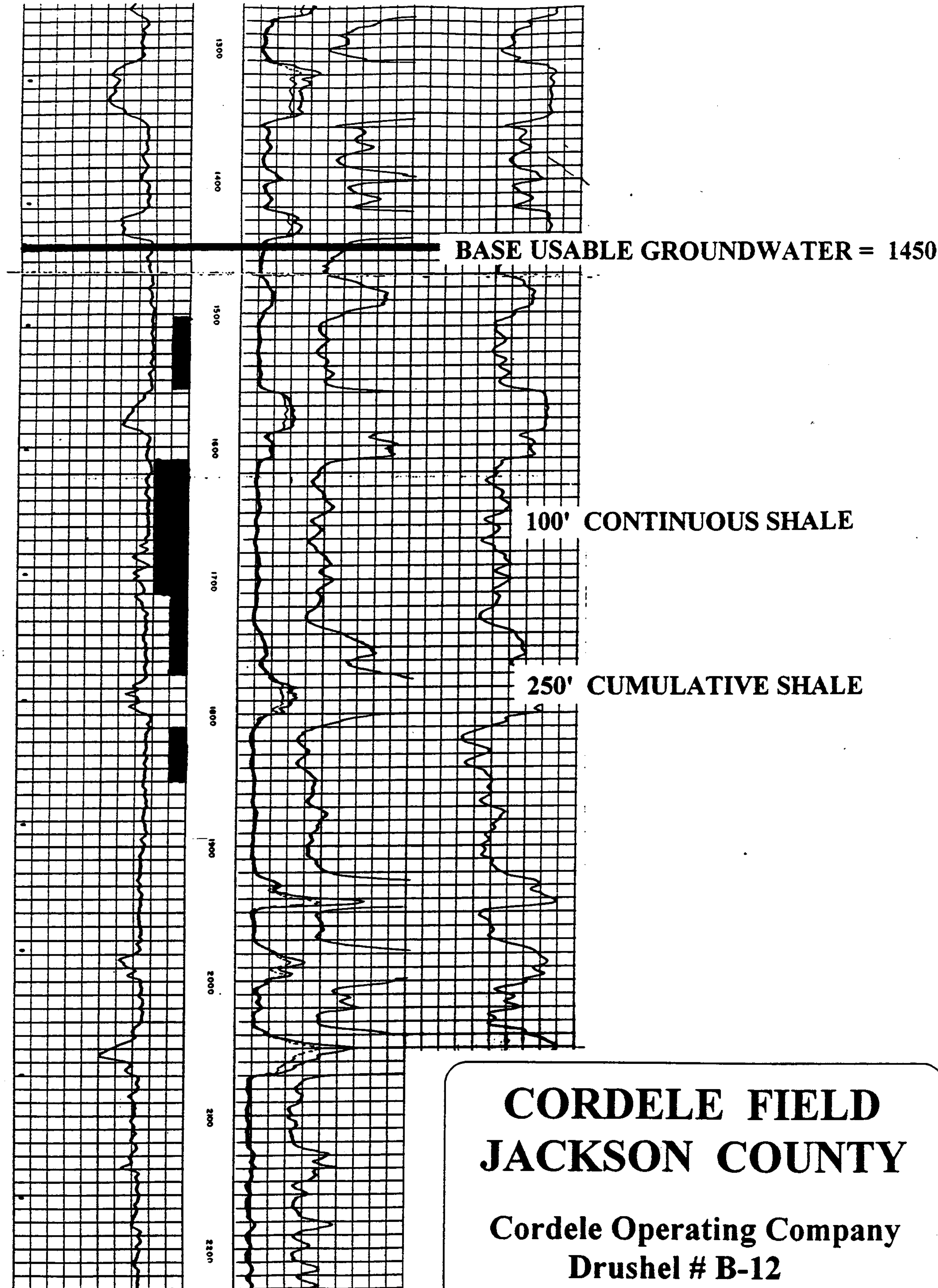


BASE USABLE GROUNDWATER = 1250'
250' CUMULATIVE SHALE
100' CONTINUOUS SHALE
OYSTER BAYOU
CHAMBERS COUNTY
Dow Chemical Company
C. T. Garth #2




# STOWELL FIELD CHAMBERS COUNTY

**Al Brown Company**
**Baten Williams #6**

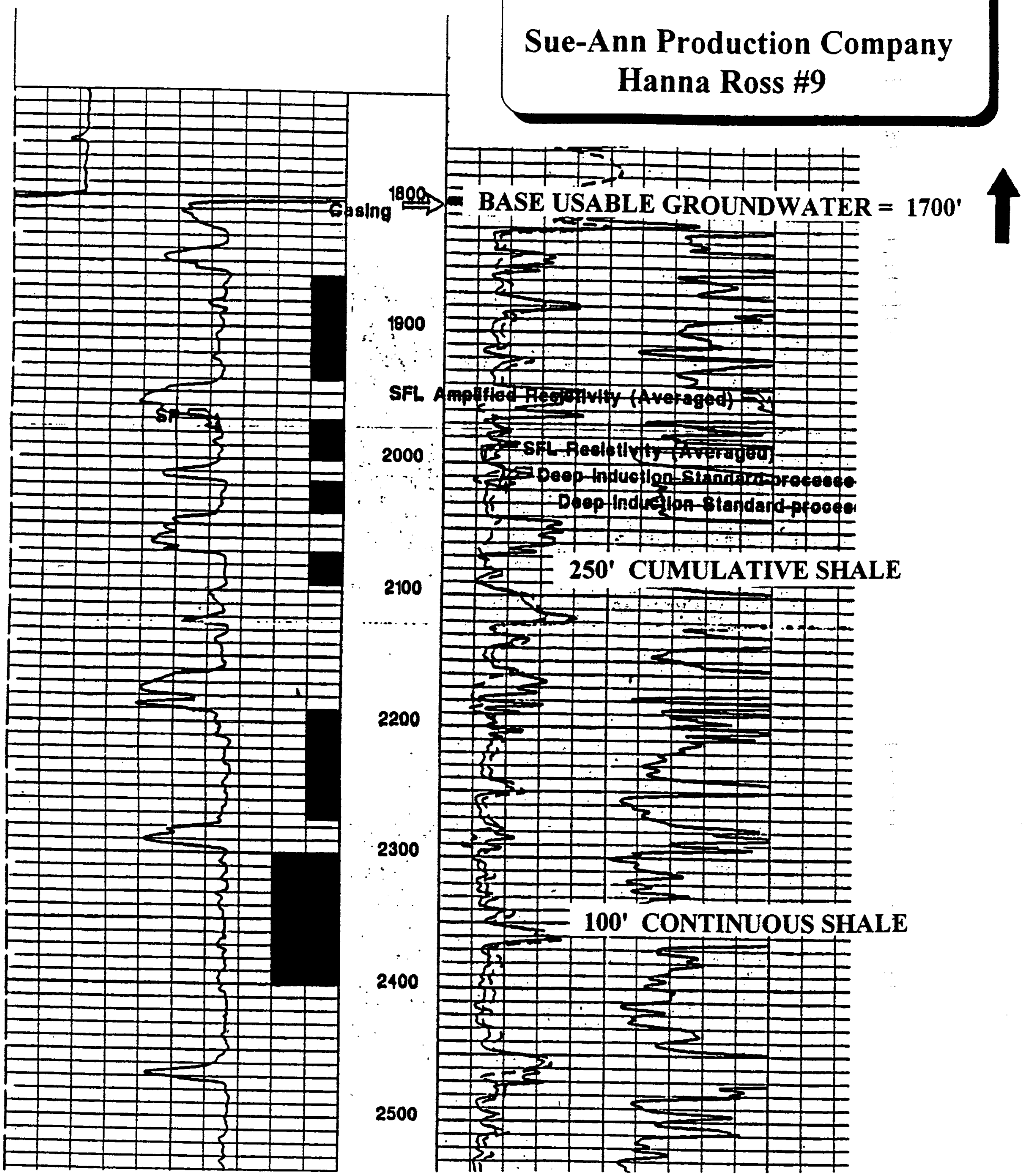



# CORDELE FIELD
# JACKSON COUNTY

**Cordele Operating Company**
**Drushel # B-12**

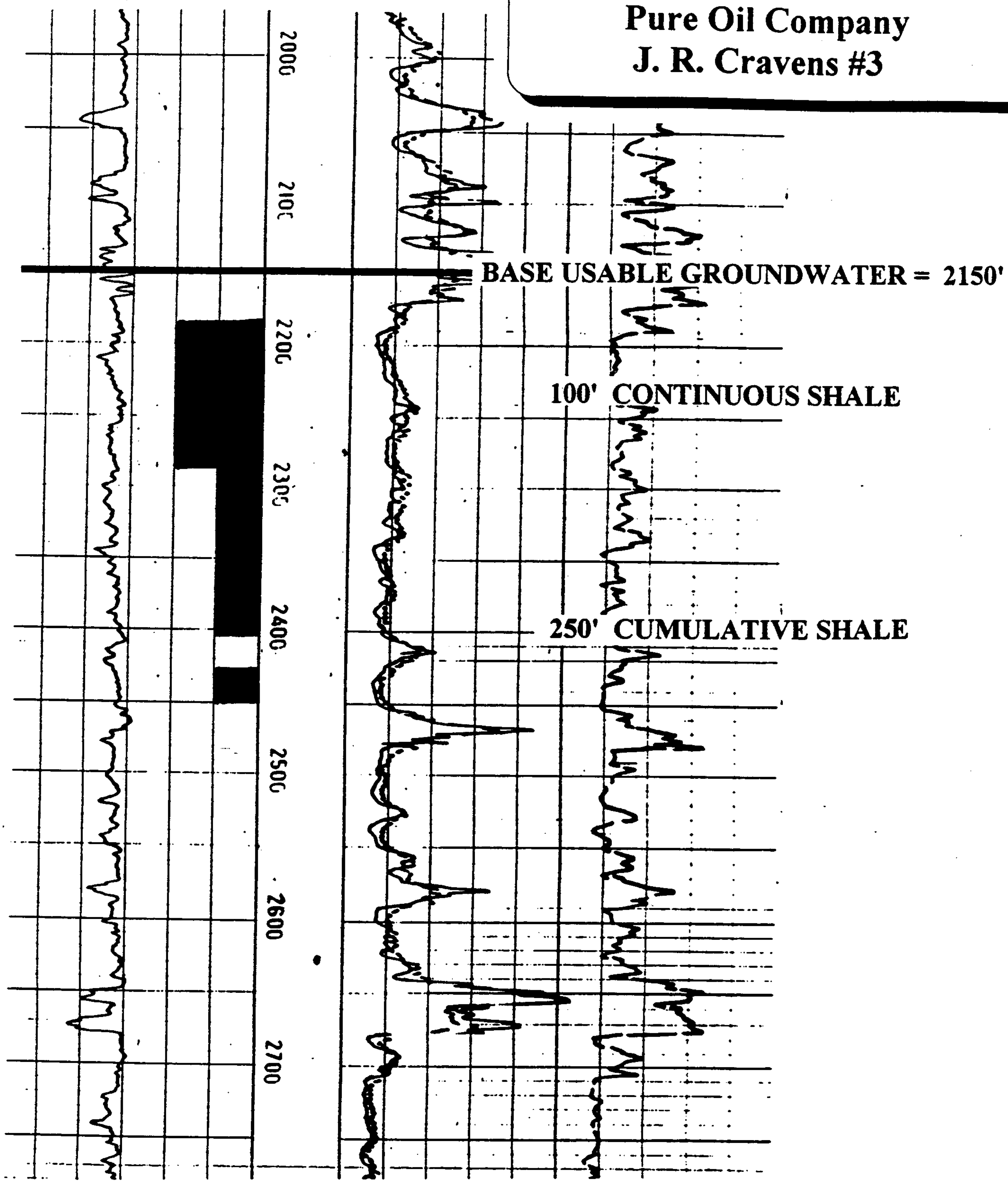
# GANADO FIELD
# JACKSON COUNTY

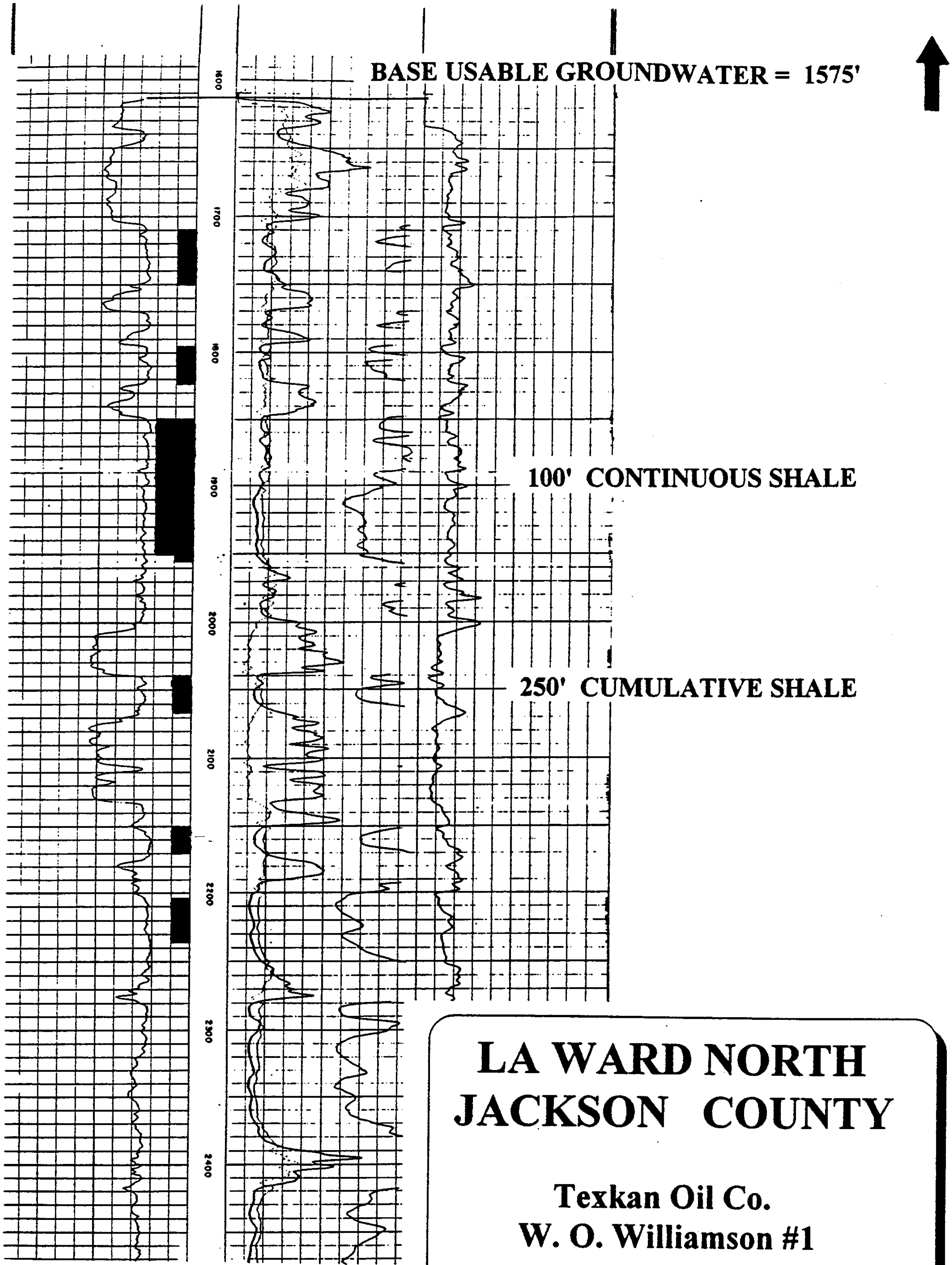
**Sue-Ann Production Company**
**Hanna Ross #9**



# GANADO WEST
# JACKSON COUNTY

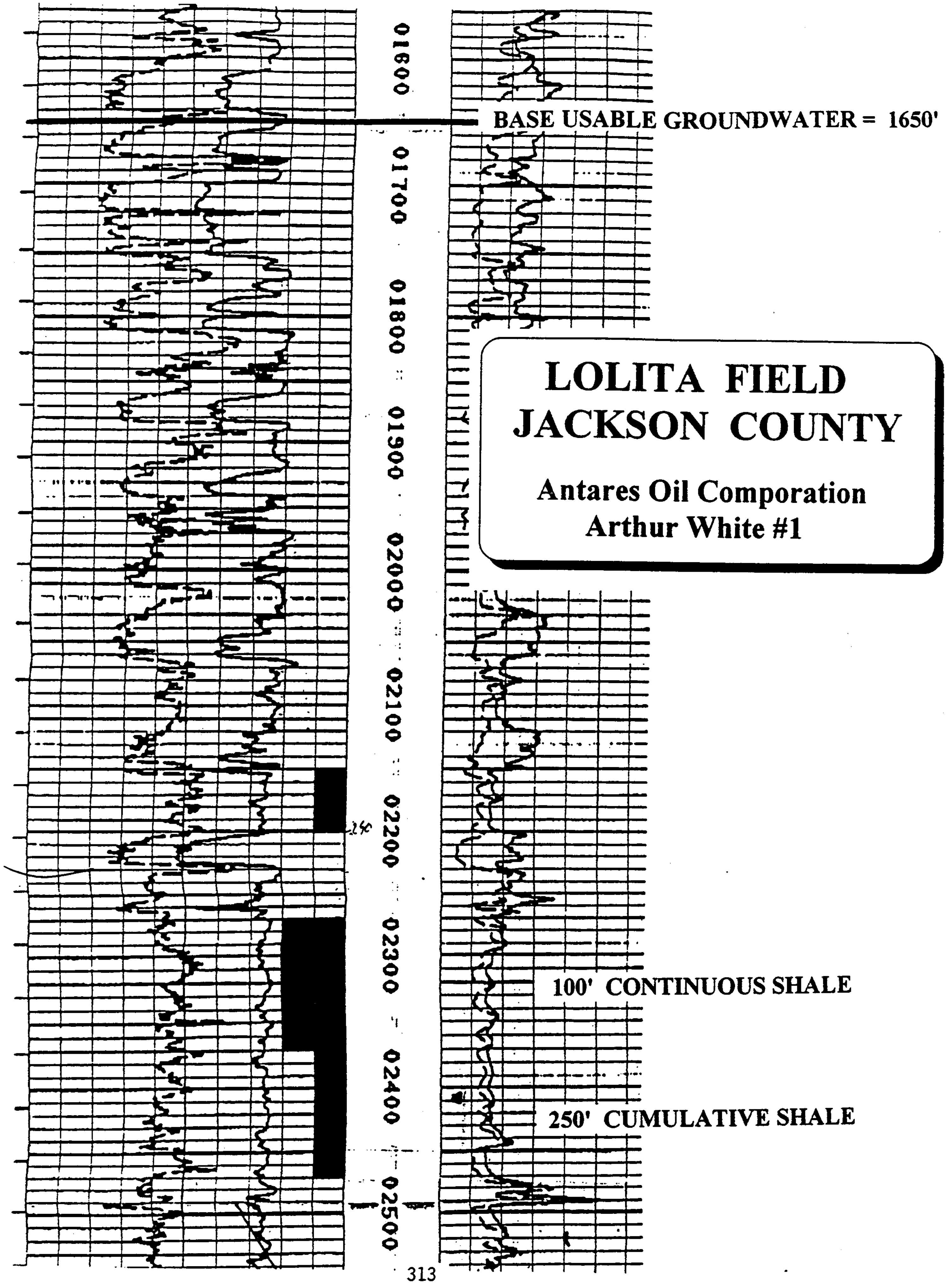
**Pure Oil Company**
**J. R. Cravens #3**

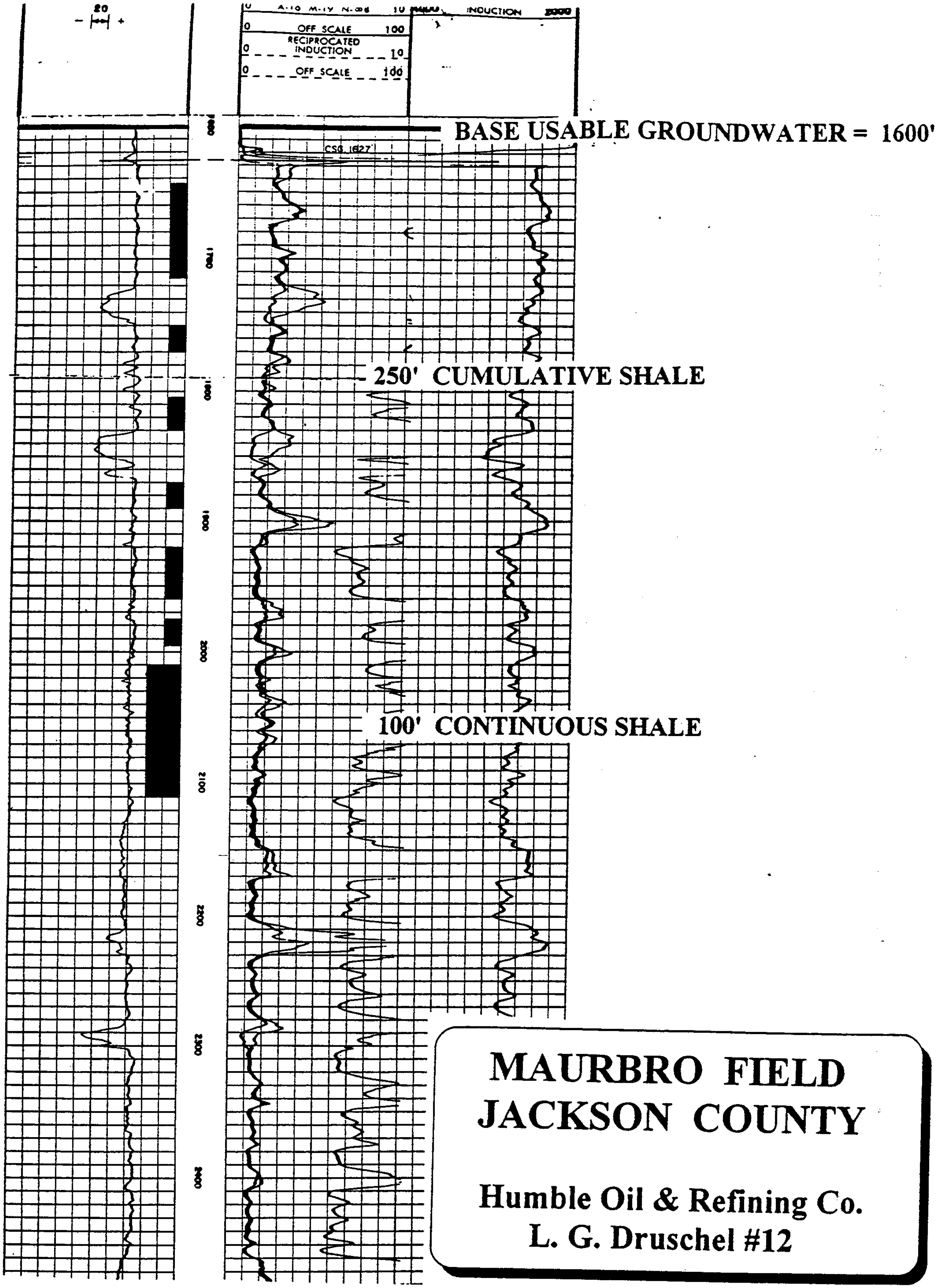





# LA WARD NORTH
# JACKSON COUNTY

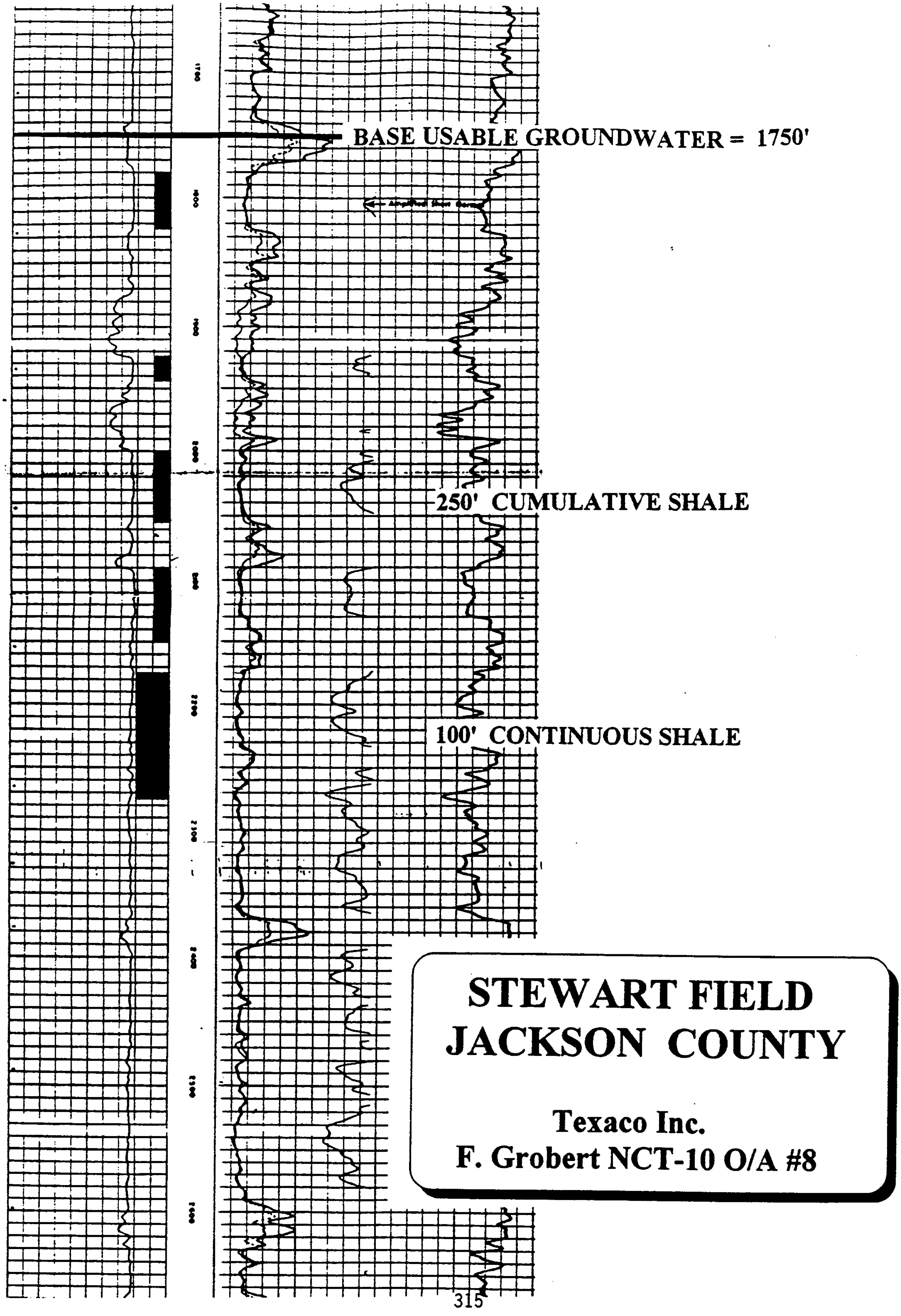
**Texkan Oil Co.**
**W. O. Williamson #1**

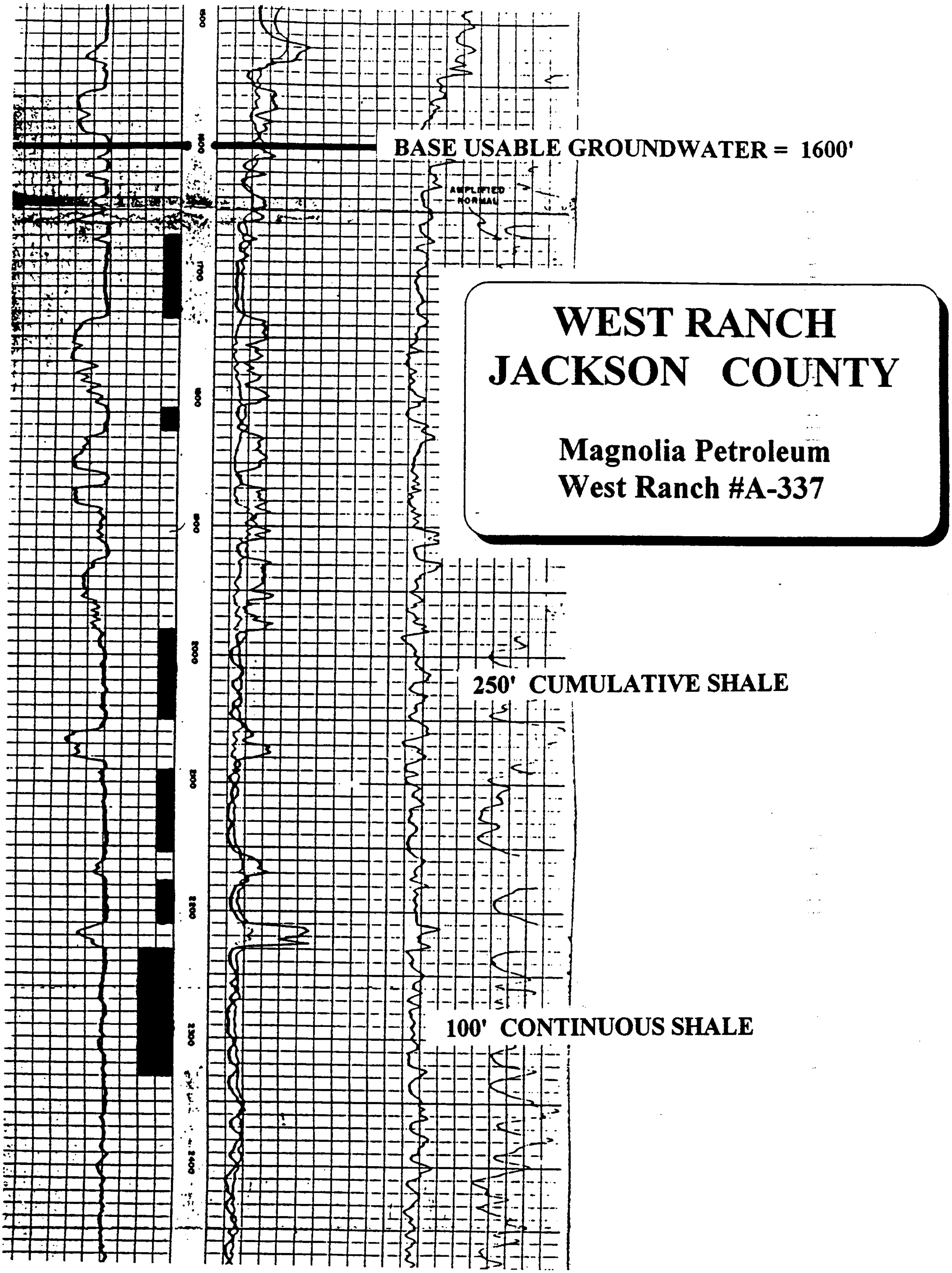

BASE USABLE GROUNDWATER = 1650'
LOLITA FIELD
JACKSON COUNTY
Antares Oil Comporation
Arthur White #1
100' CONTINUOUS SHALE
250' CUMULATIVE SHALE
01600
01700
01800
01900
02000
02100
02200
02300
02400
02500

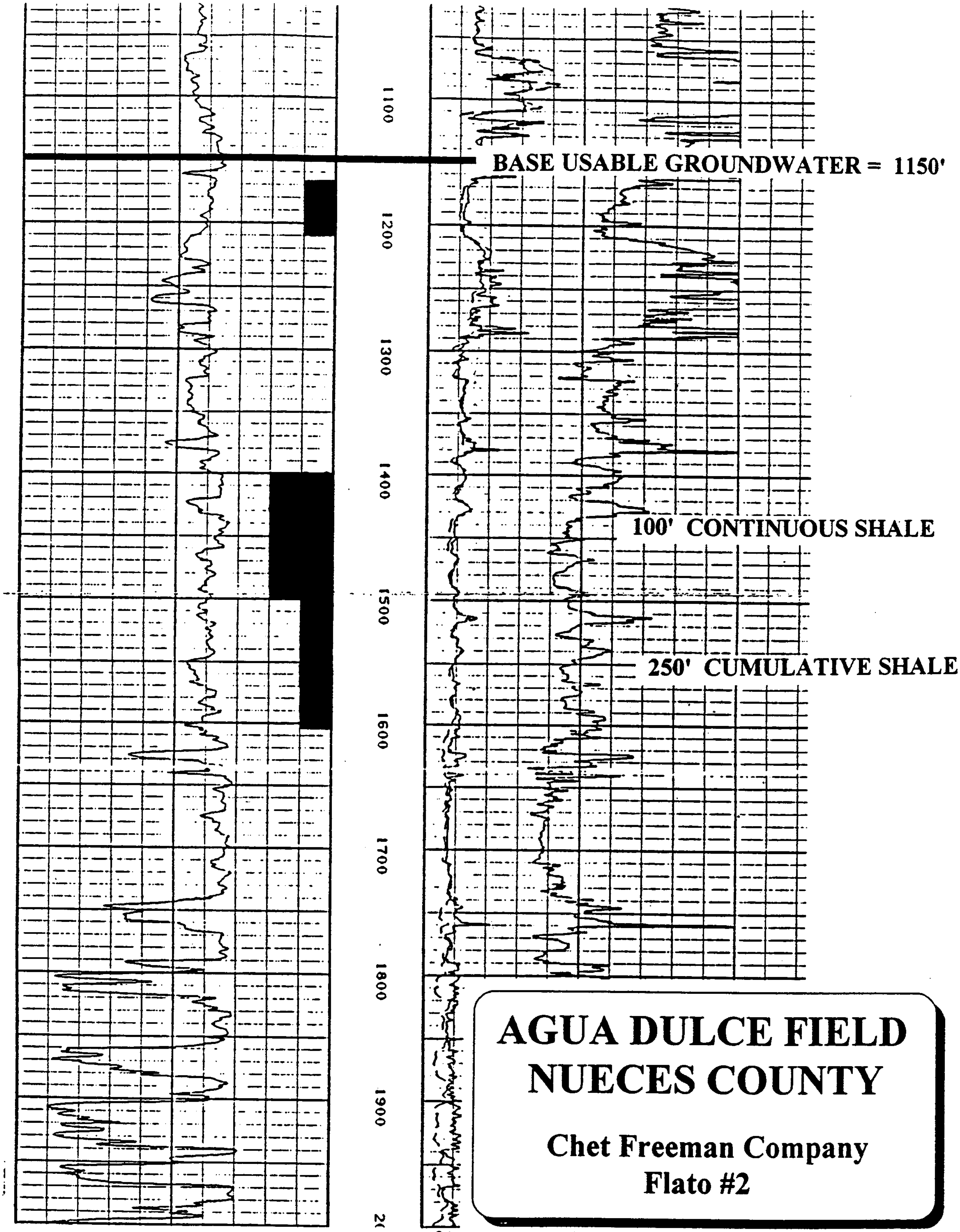



**MAURBRO FIELD**
**JACKSON COUNTY**

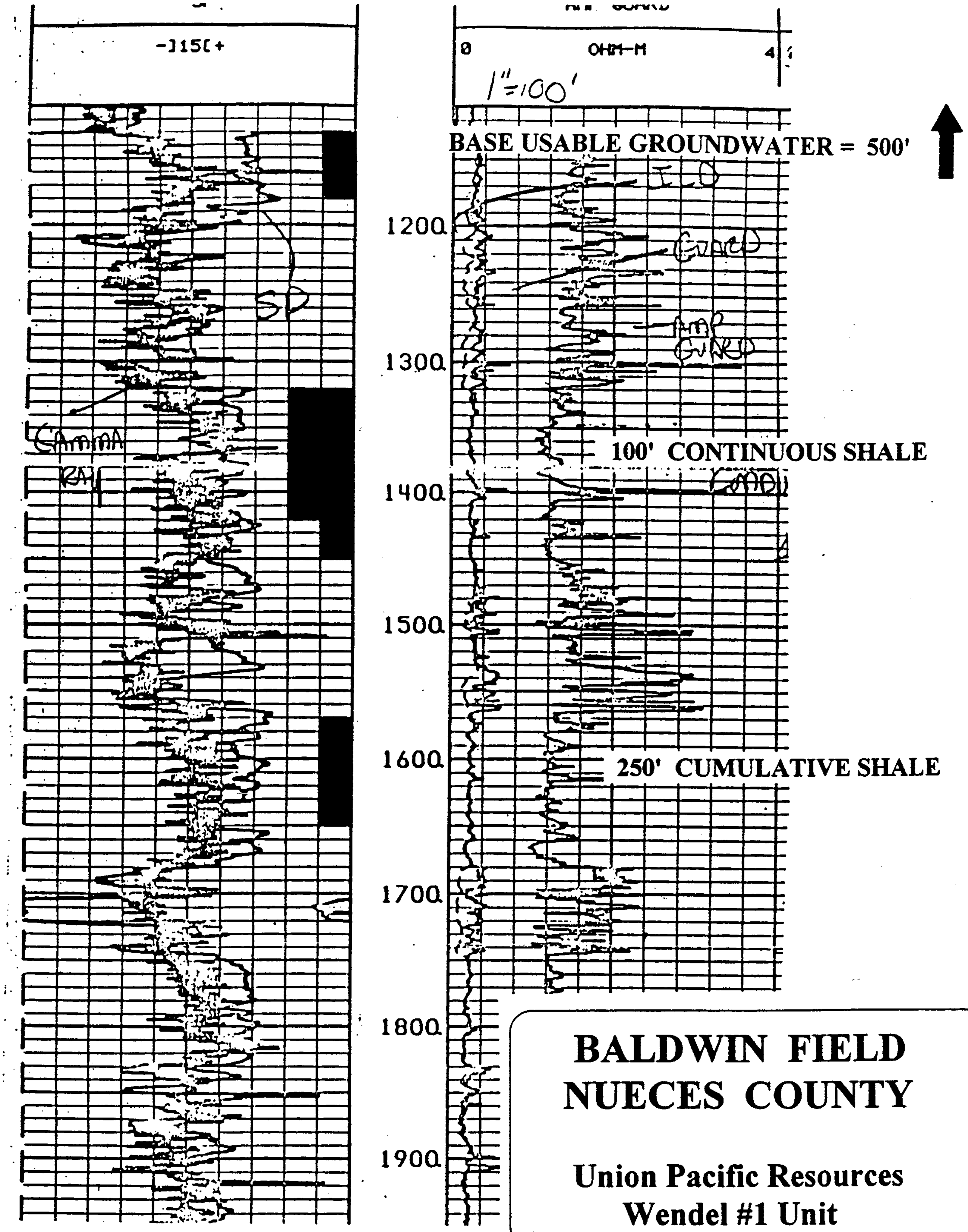
**Humble Oil & Refining Co.**
**L. G. Druschel #12**


BASE USABLE GROUNDWATER = 1750'
250' CUMULATIVE SHALE
100' CONTINUOUS SHALE
STEWART FIELD
JACKSON COUNTY
Texaco Inc.
F. Grobert NCT-10 O/A #8


BASE USABLE GROUNDWATER = 1600'
WEST RANCH
JACKSON COUNTY
Magnolia Petroleum
West Ranch #A-337
250' CUMULATIVE SHALE
100' CONTINUOUS SHALE

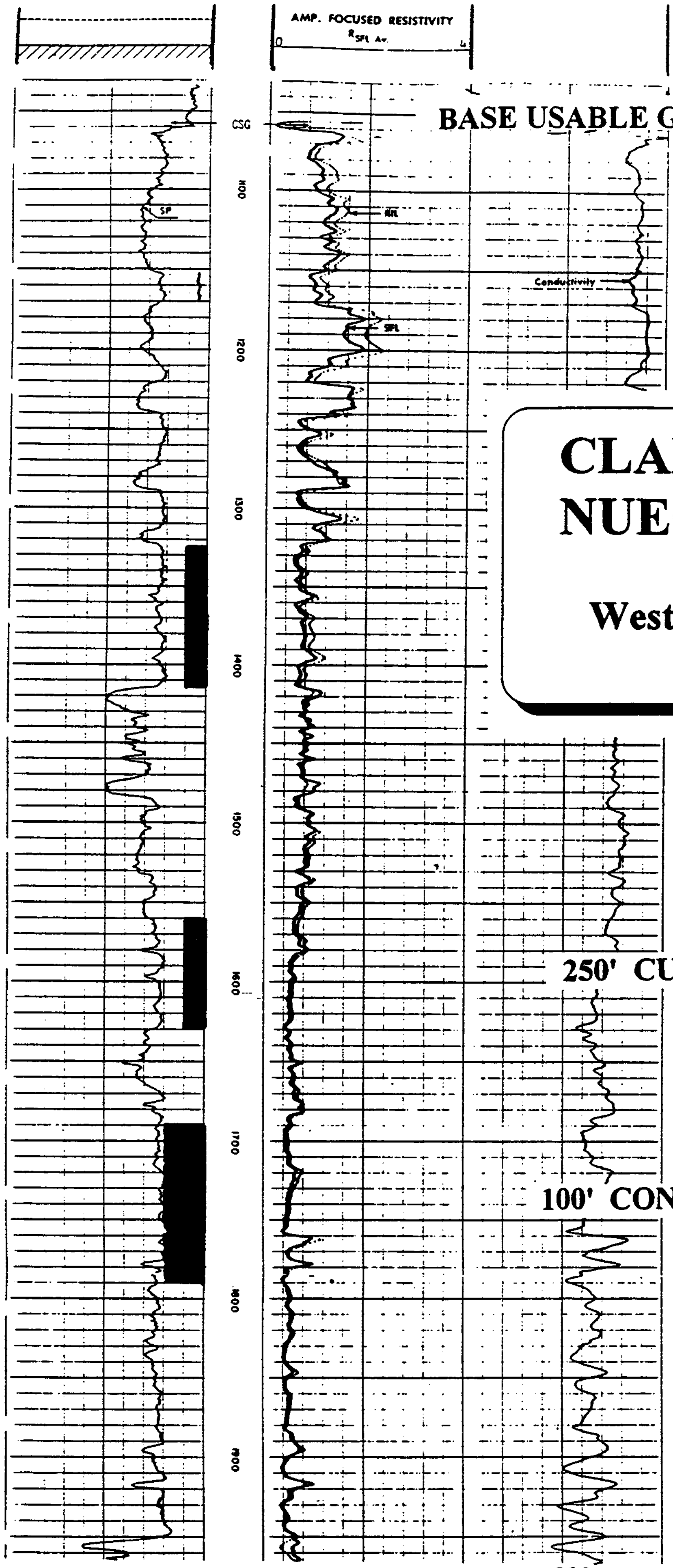


1100
1200
1300
1400
1500
1600
1700
1800
1900
BASE USABLE GROUNDWATER = 1150'
100' CONTINUOUS SHALE
250' CUMULATIVE SHALE
AGUA DULCE FIELD
NUECES COUNTY
Chet Freeman Company
Flato #2




# BALDWIN FIELD
# NUECES COUNTY

**Union Pacific Resources**
**Wendel #1 Unit**



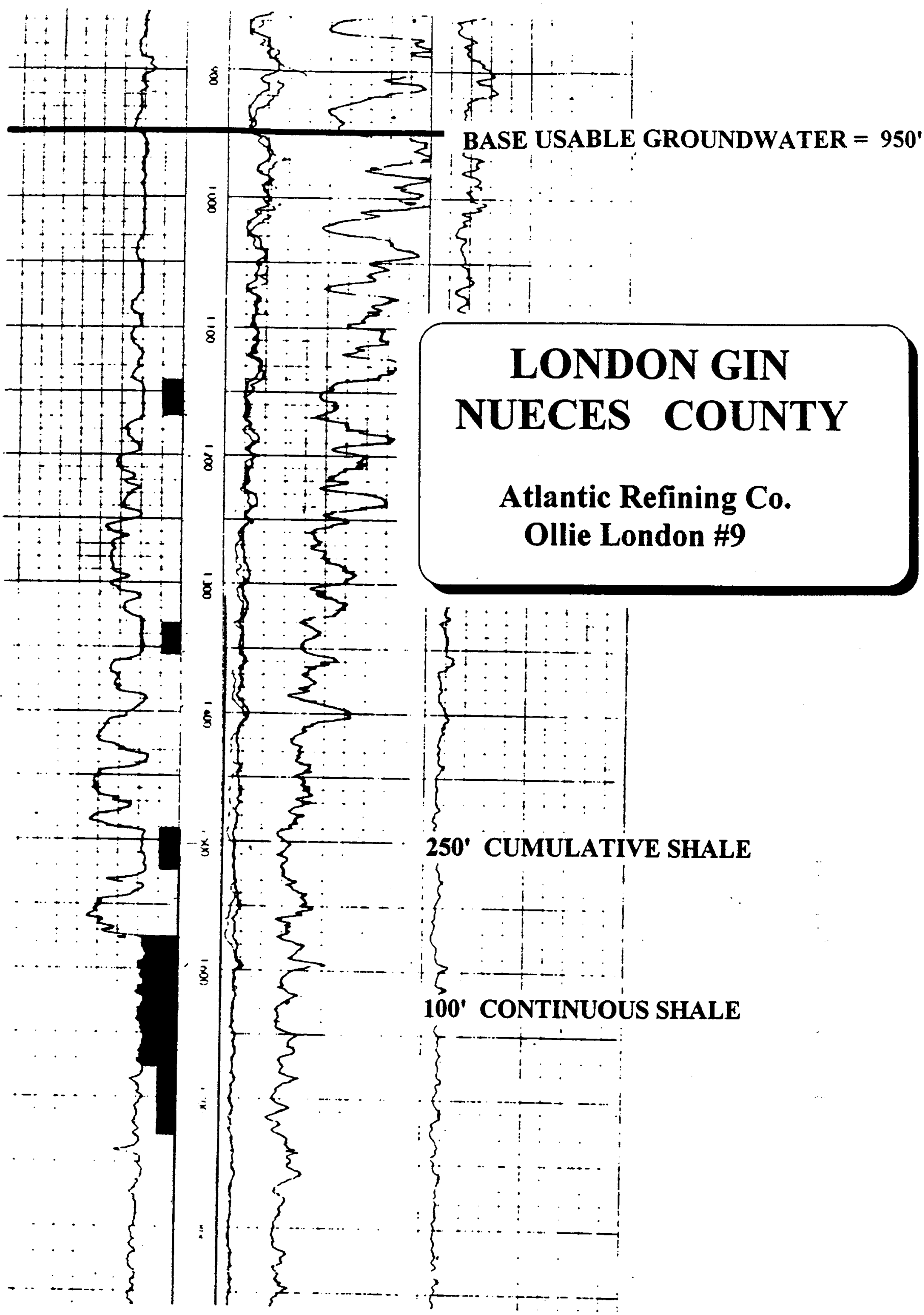

BASE USABLE GROUNDWATER = 1000'

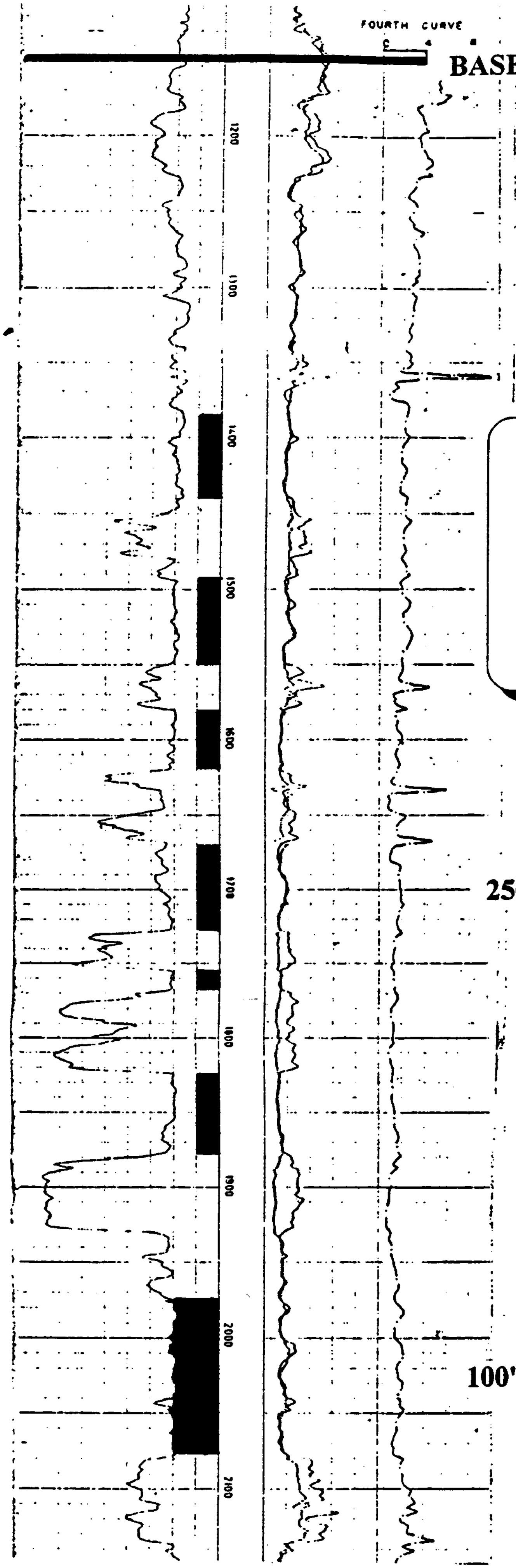
# CLARA DRISCOLL
# NUECES COUNTY

**Western Gulf Oil & Gas**
**Sevier #1**

**250' CUMULATIVE SHALE**

**100' CONTINUOUS SHALE**


BASE USABLE GROUNDWATER = 950'
LONDON GIN
NUECES COUNTY
Atlantic Refining Co.
Ollie London #9
250' CUMULATIVE SHALE
100' CONTINUOUS SHALE



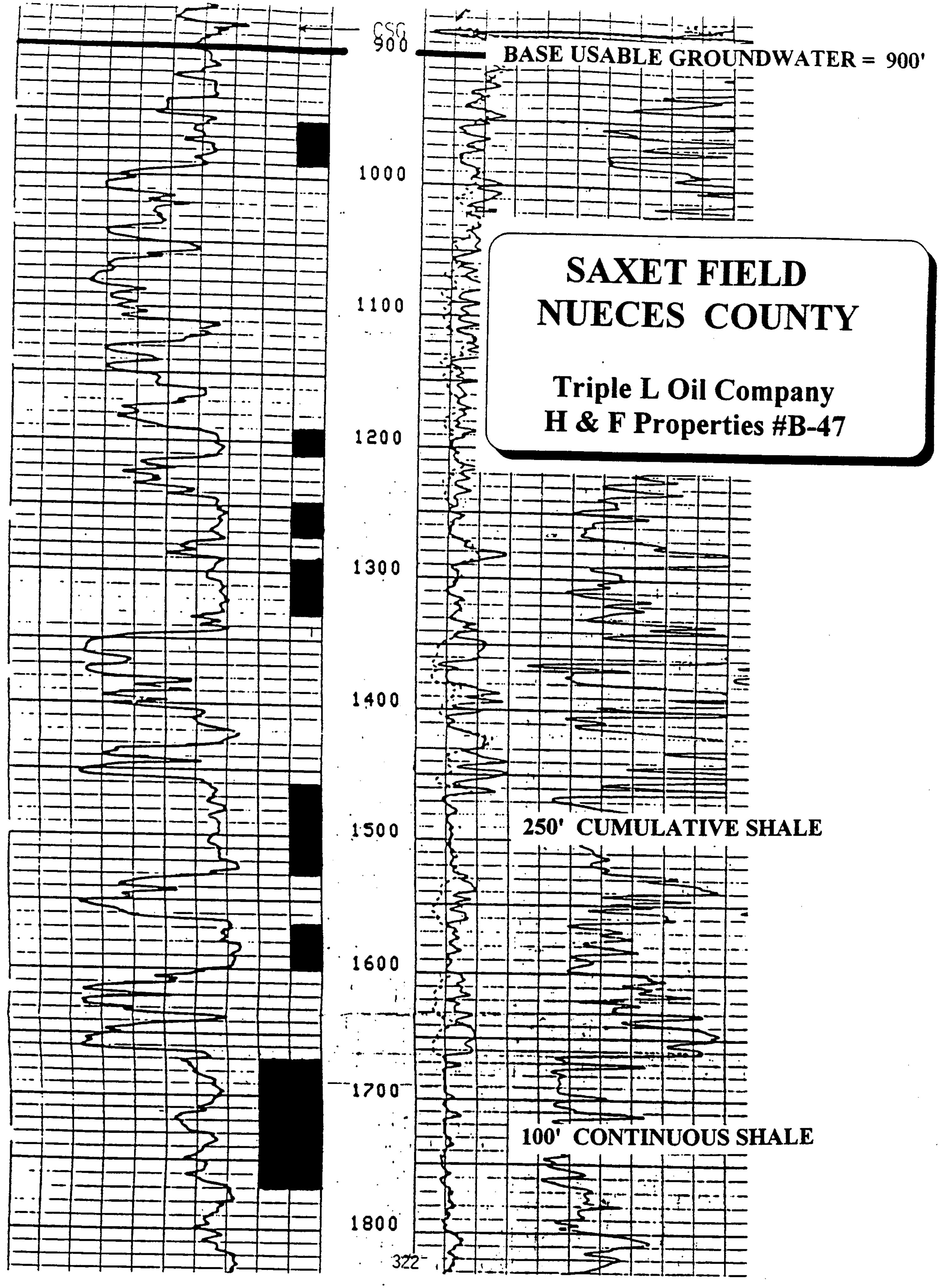

BASE USABLE GROUNDWATER = 1150'

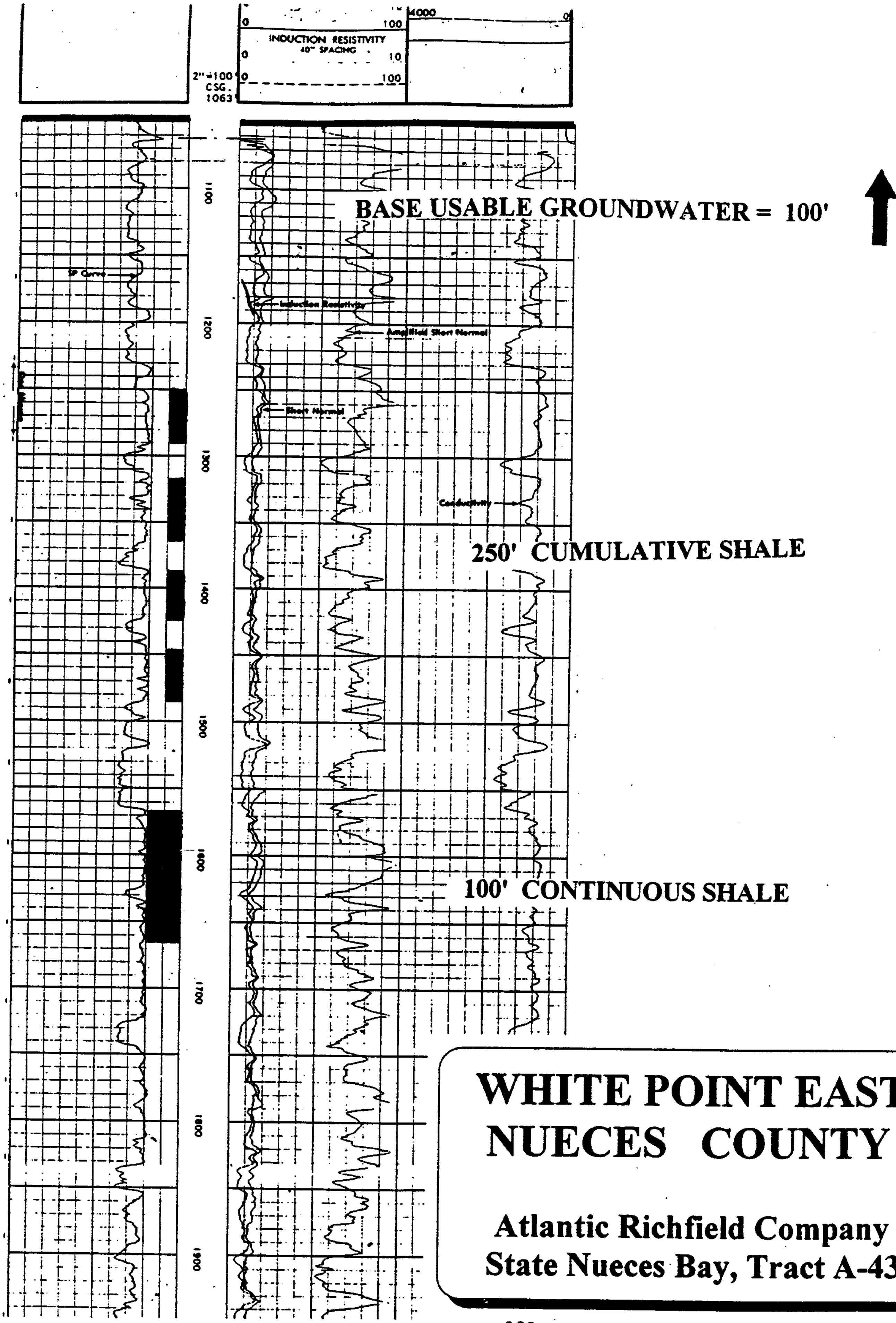
# RICHARD KING
# NUECES COUNTY

**Southern Minerals**
**Ida Walker #4**

250' CUMULATIVE SHALE

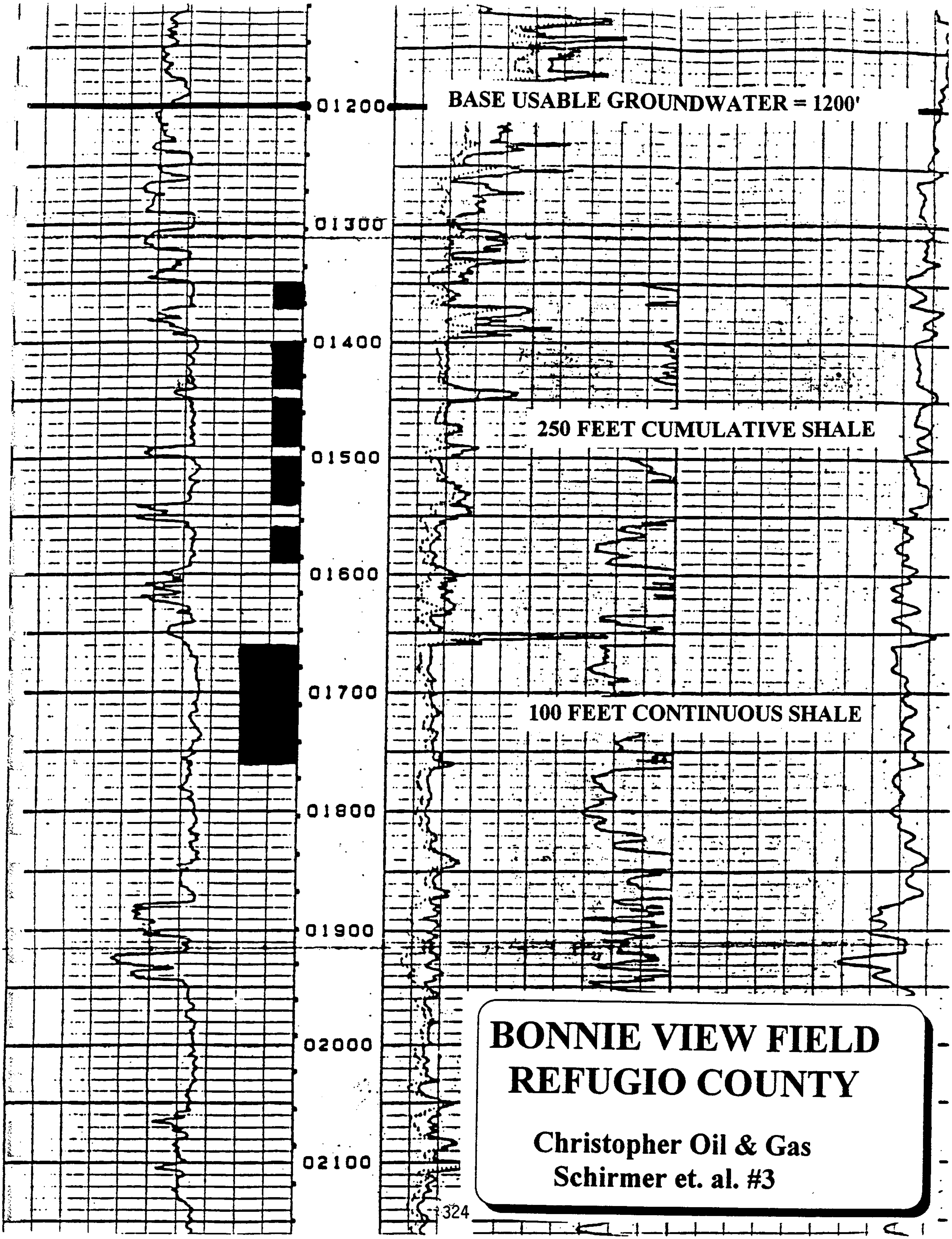
100' CONTINUOUS SHALE


CSG
900
BASE USABLE GROUNDWATER = 900'
1000
1100
SAXET FIELD
NUECES COUNTY
Triple L Oil Company
H & F Properties #B-47
1200
1300
1400
1500
250' CUMULATIVE SHALE
1600
1700
100' CONTINUOUS SHALE
1800
322



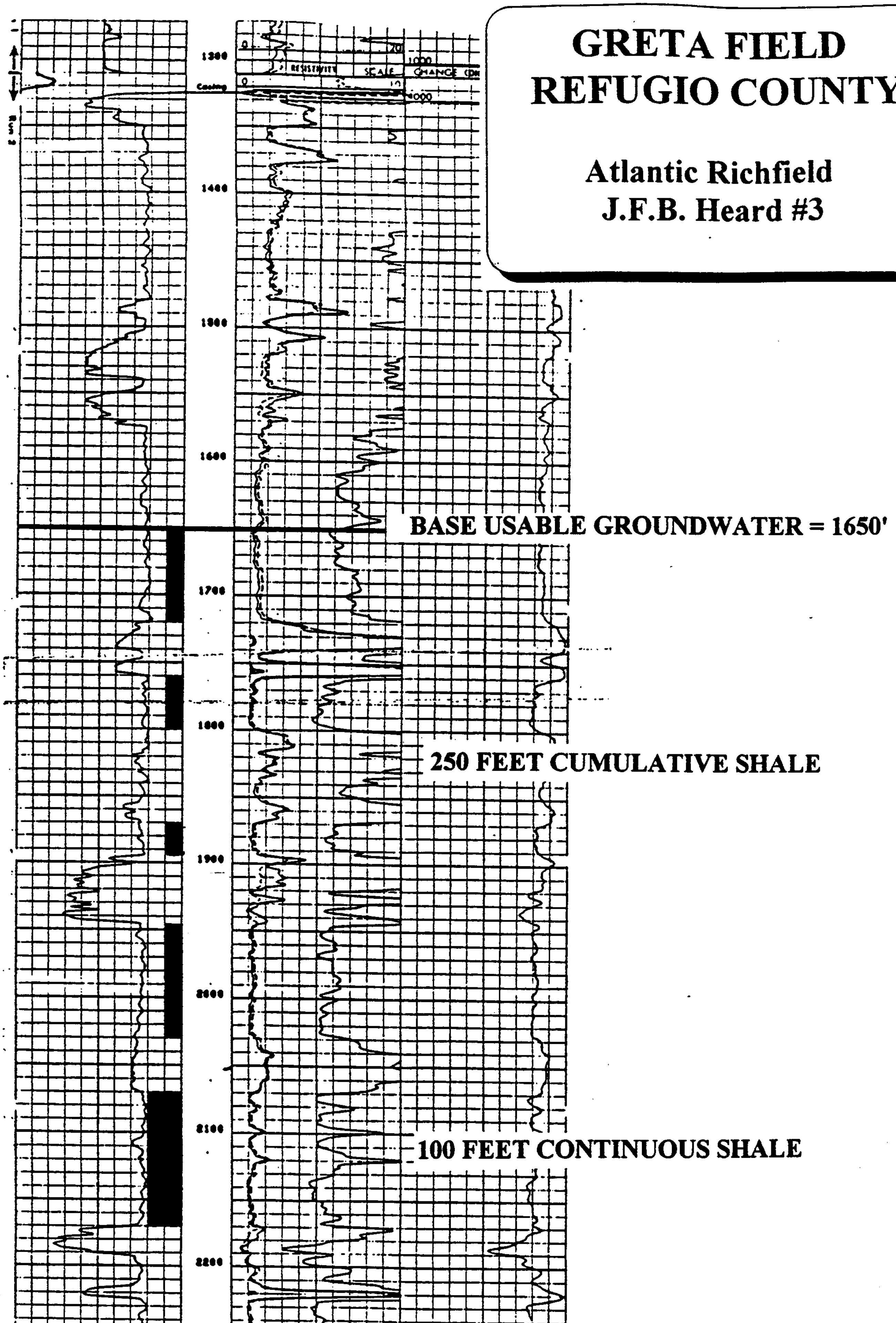

# WHITE POINT EAST
# NUECES COUNTY

**Atlantic Richfield Company**
**State Nueces Bay, Tract A-43**


BASE USABLE GROUNDWATER = 1200'
250 FEET CUMULATIVE SHALE
100 FEET CONTINUOUS SHALE
01200
01300
01400
01500
01600
01700
01800
01900
02000
02100
324
BONNIE VIEW FIELD
REFUGIO COUNTY
Christopher Oil & Gas
Schirmer et. al. #3

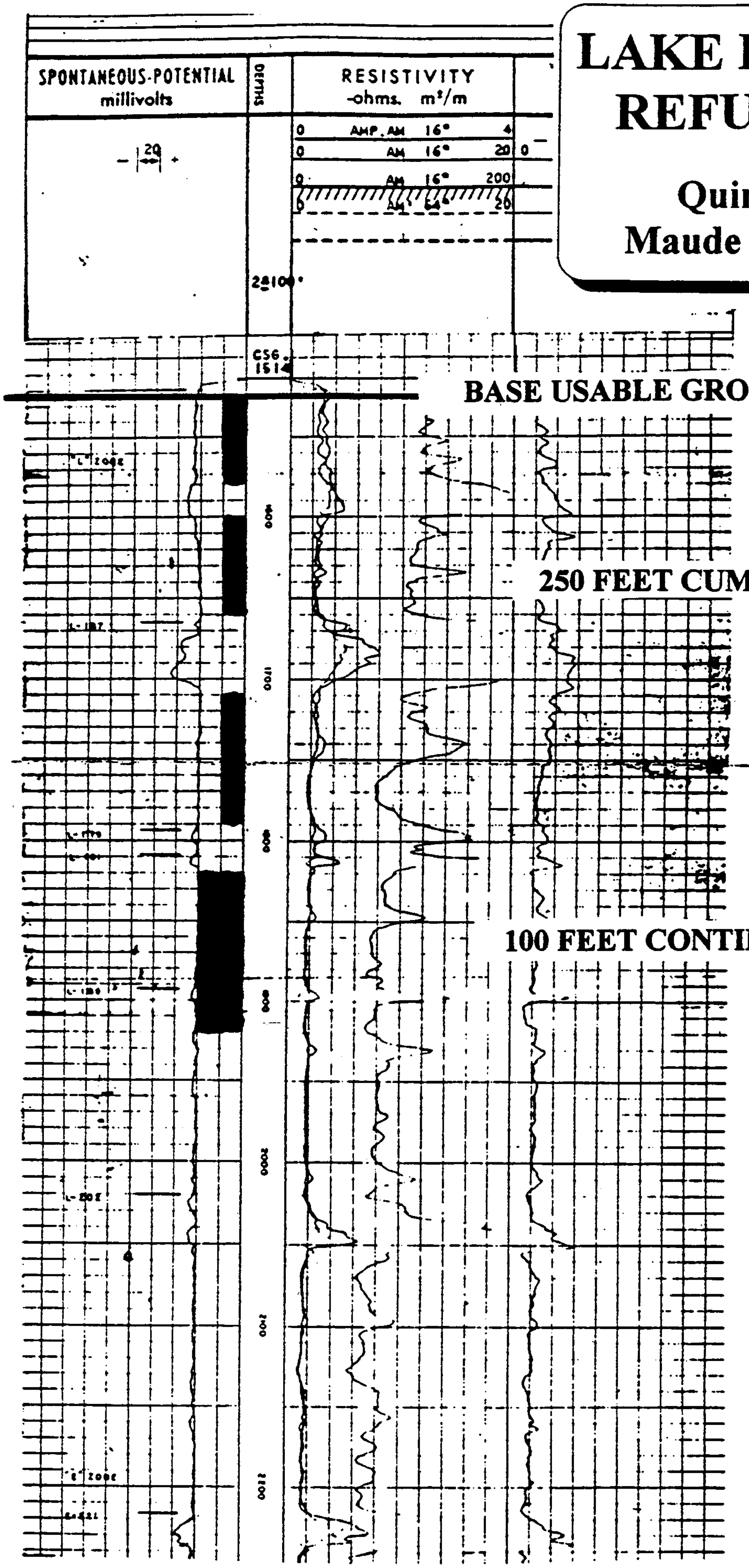
# GRETA FIELD
# REFUGIO COUNTY

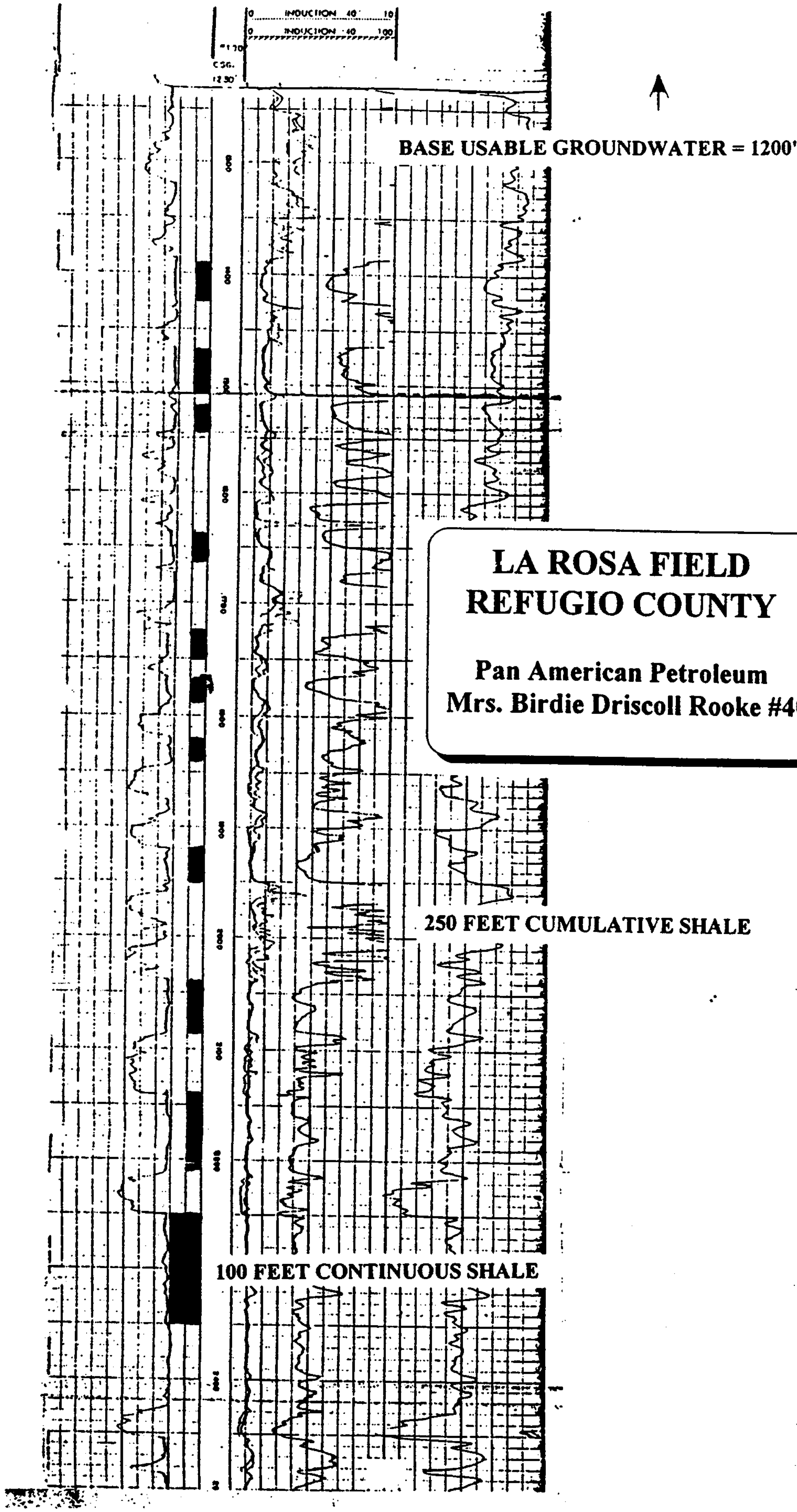
**Atlantic Richfield**
**J.F.B. Heard #3**



# LAKE PASTURE FIELD
# REFUGIO COUNTY

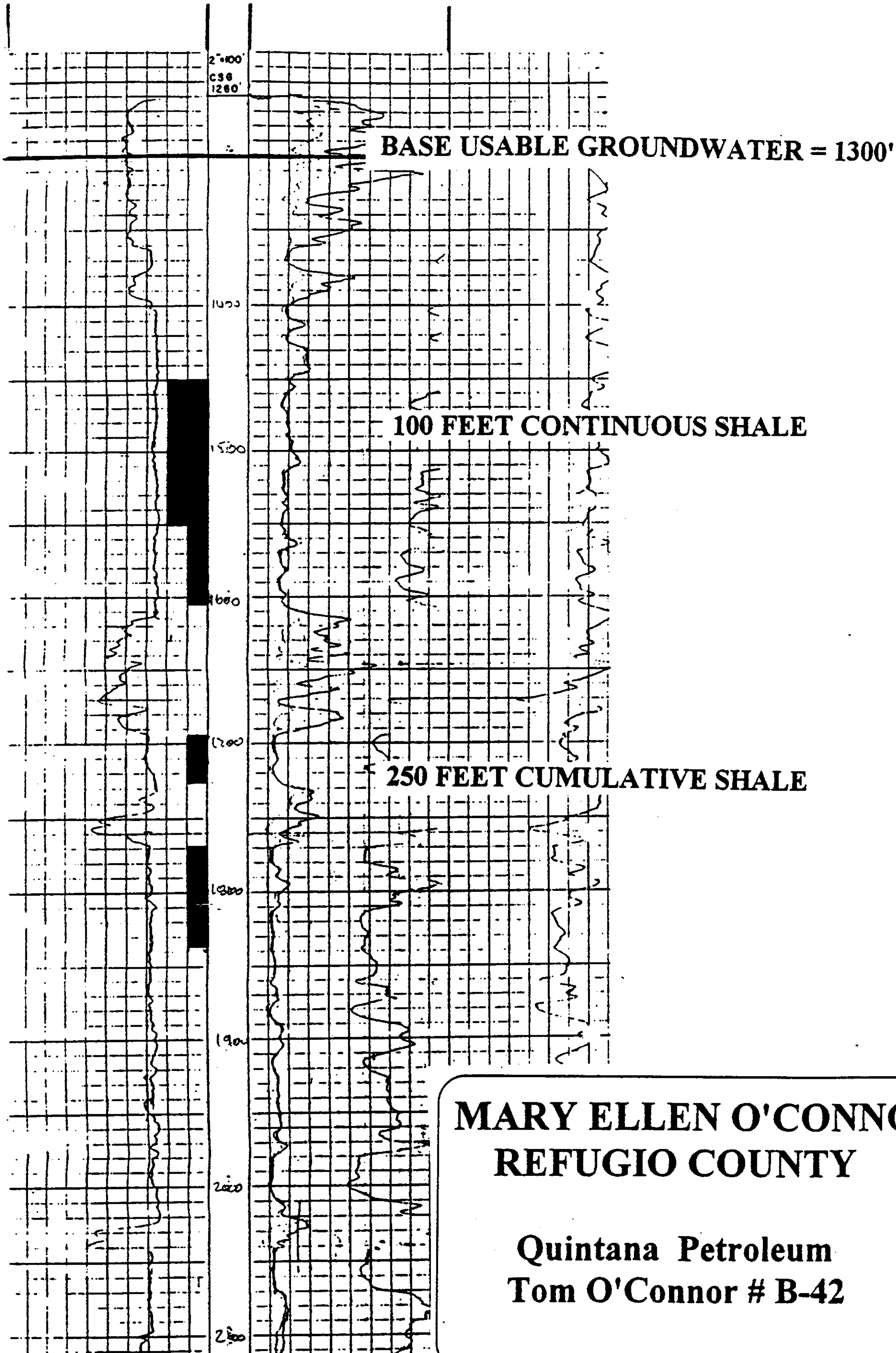
**Quintana Petroleum**
**Maude Williams "A" #O-5**






**LA ROSA FIELD**
**REFUGIO COUNTY**

**Pan American Petroleum**
**Mrs. Birdie Driscoll Rooke #40**

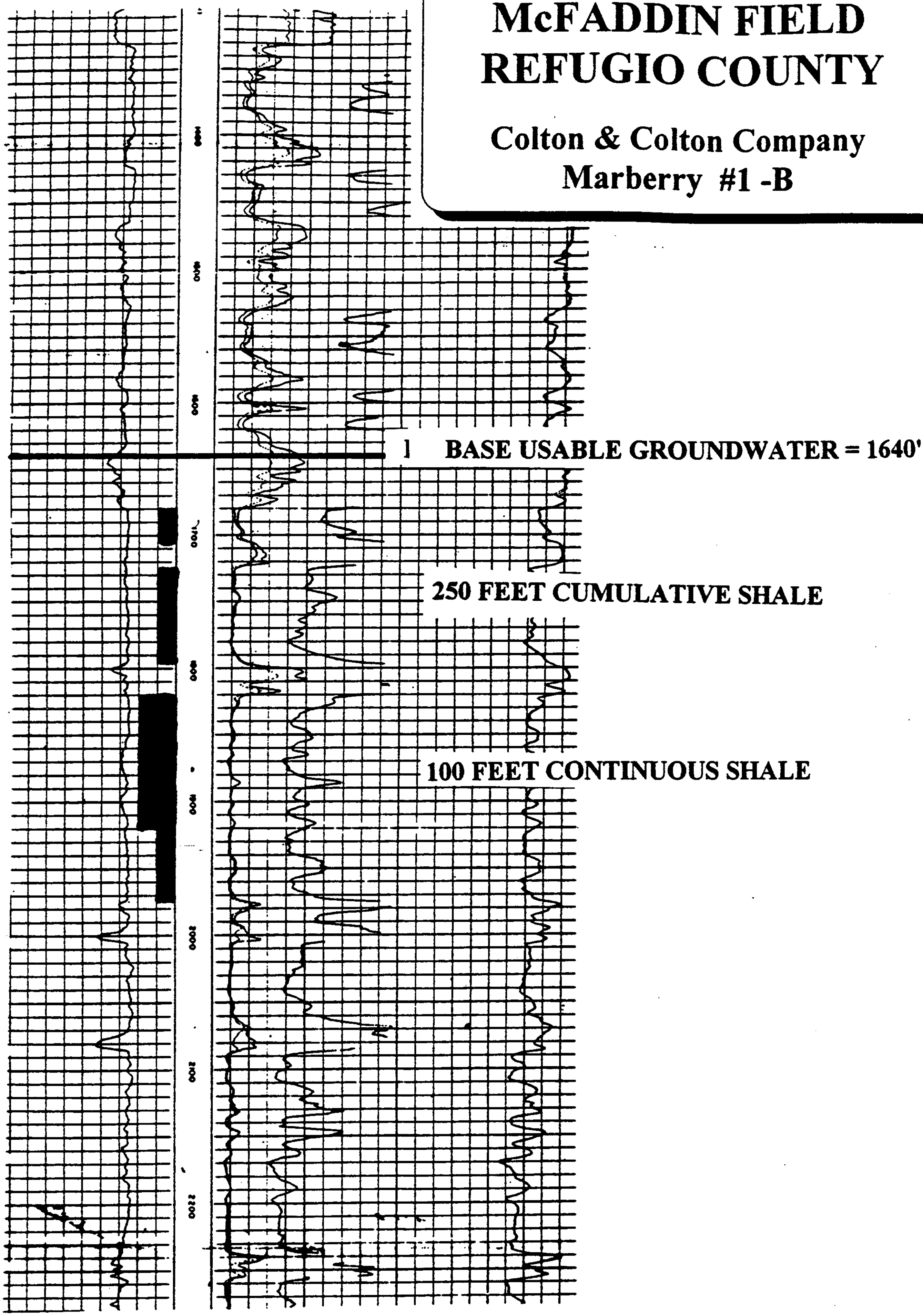



**MARY ELLEN O'CONNOR**
**REFUGIO COUNTY**

**Quintana Petroleum**
**Tom O'Connor # B-42**

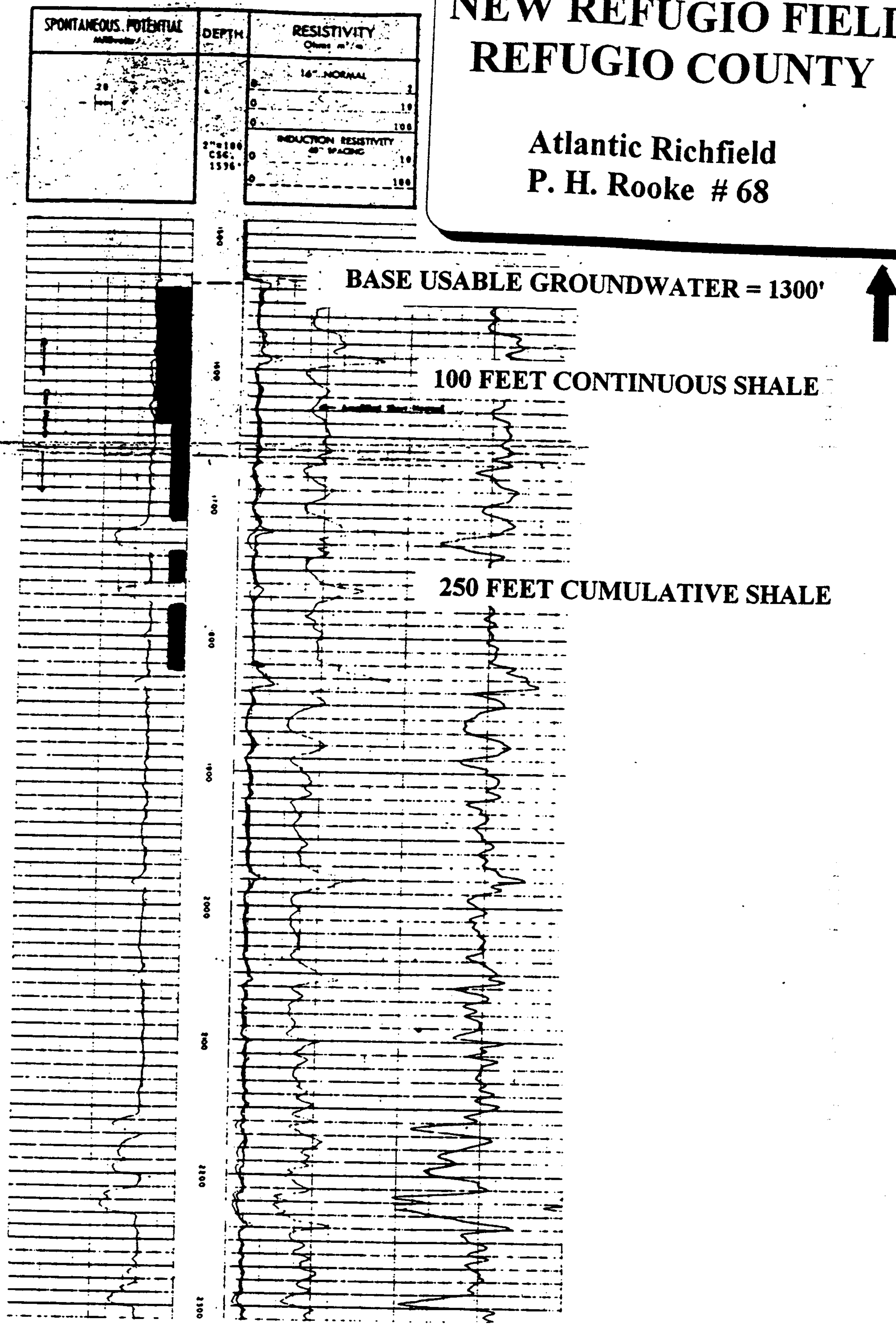
# McFADDIN FIELD
# REFUGIO COUNTY

**Colton & Colton Company**
**Marberry #1 -B**



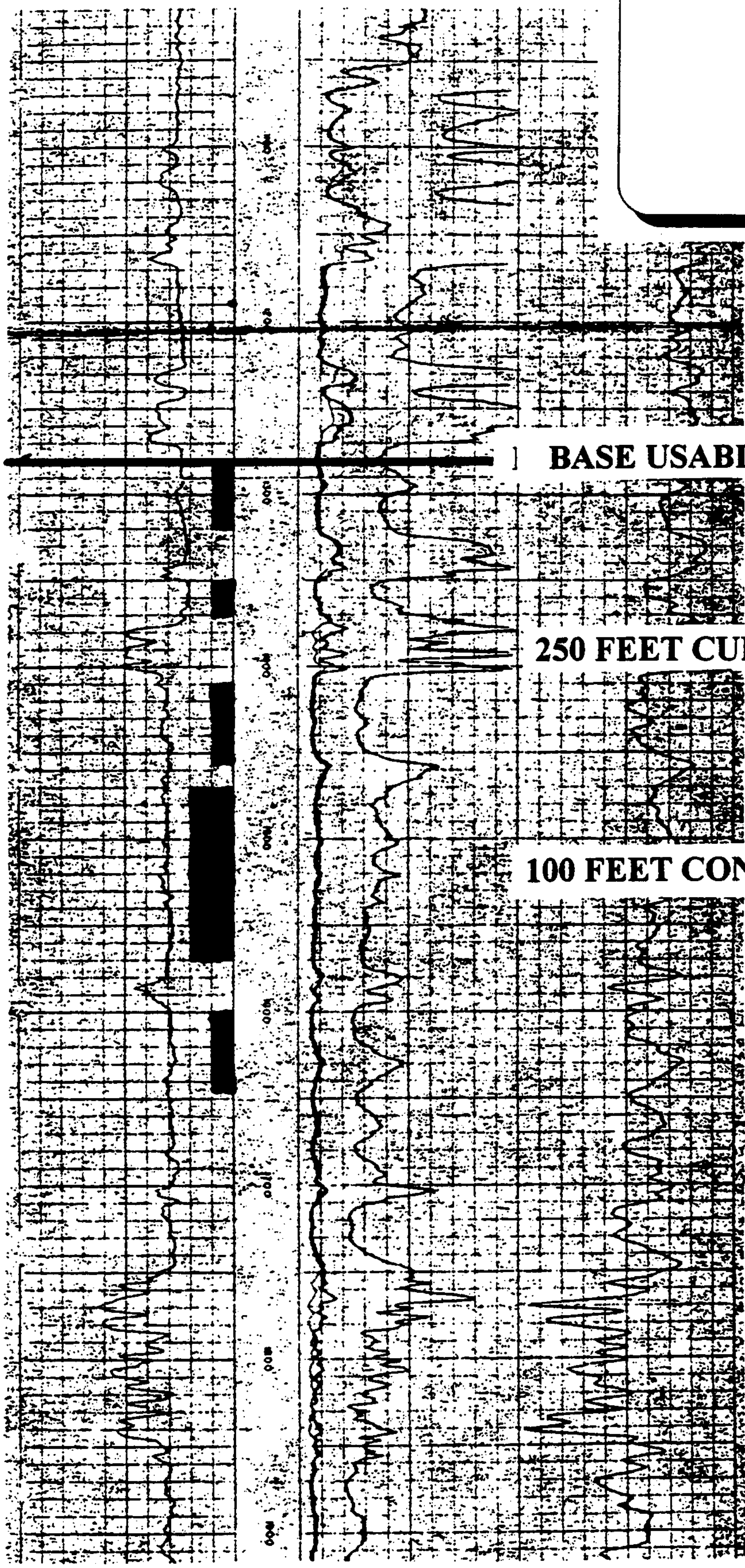
# NEW REFUGIO FIELD
# REFUGIO COUNTY

**Atlantic Richfield**
**P. H. Rooke # 68**



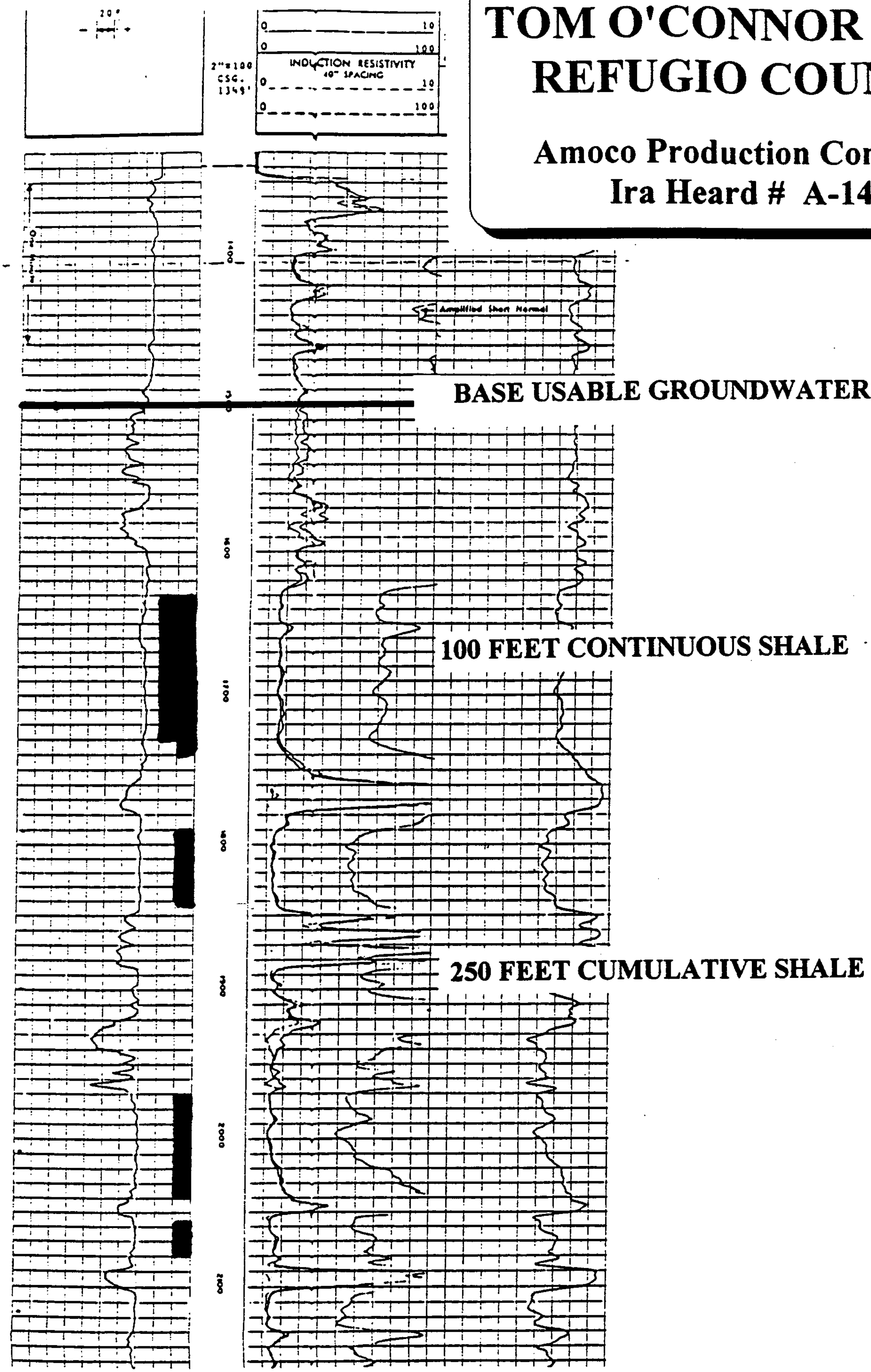
# OLD REFUGIO FIELD
# REFUGIO COUNTY

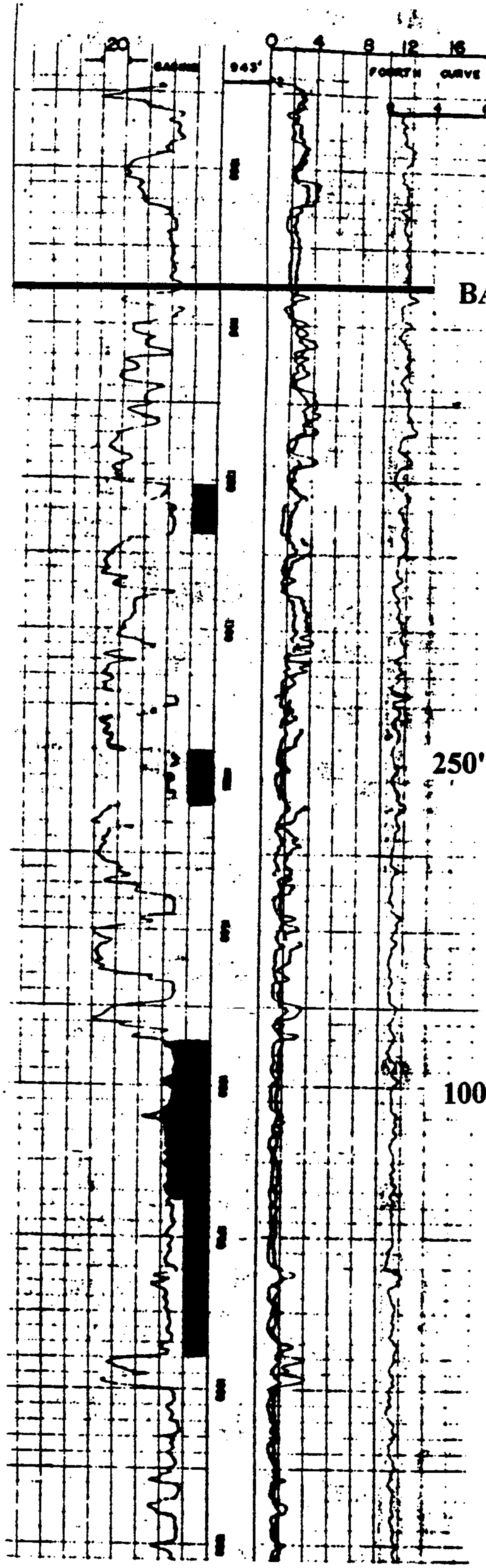
**Appen Petroleum**
**A. R. Craz #1**



# TOM O'CONNOR FIELD
# REFUGIO COUNTY

**Amoco Production Company**
**Ira Heard # A-14**





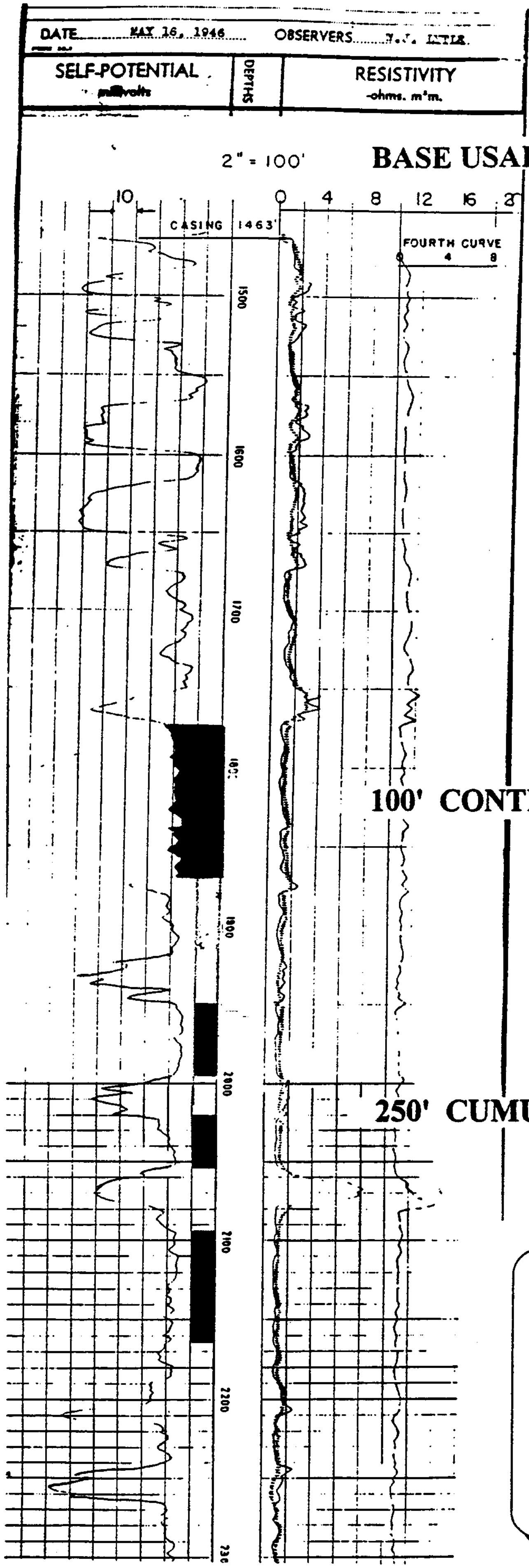
BASE USABLE GROUNDWATER = 1080'

250' CUMULATIVE SHALE

100' CONTINUOUS SHALE

# MIDWAY FIELD
# SAN PATRICIO COUNTY

**Pan American Production**
**Ora L. Smith B-1**



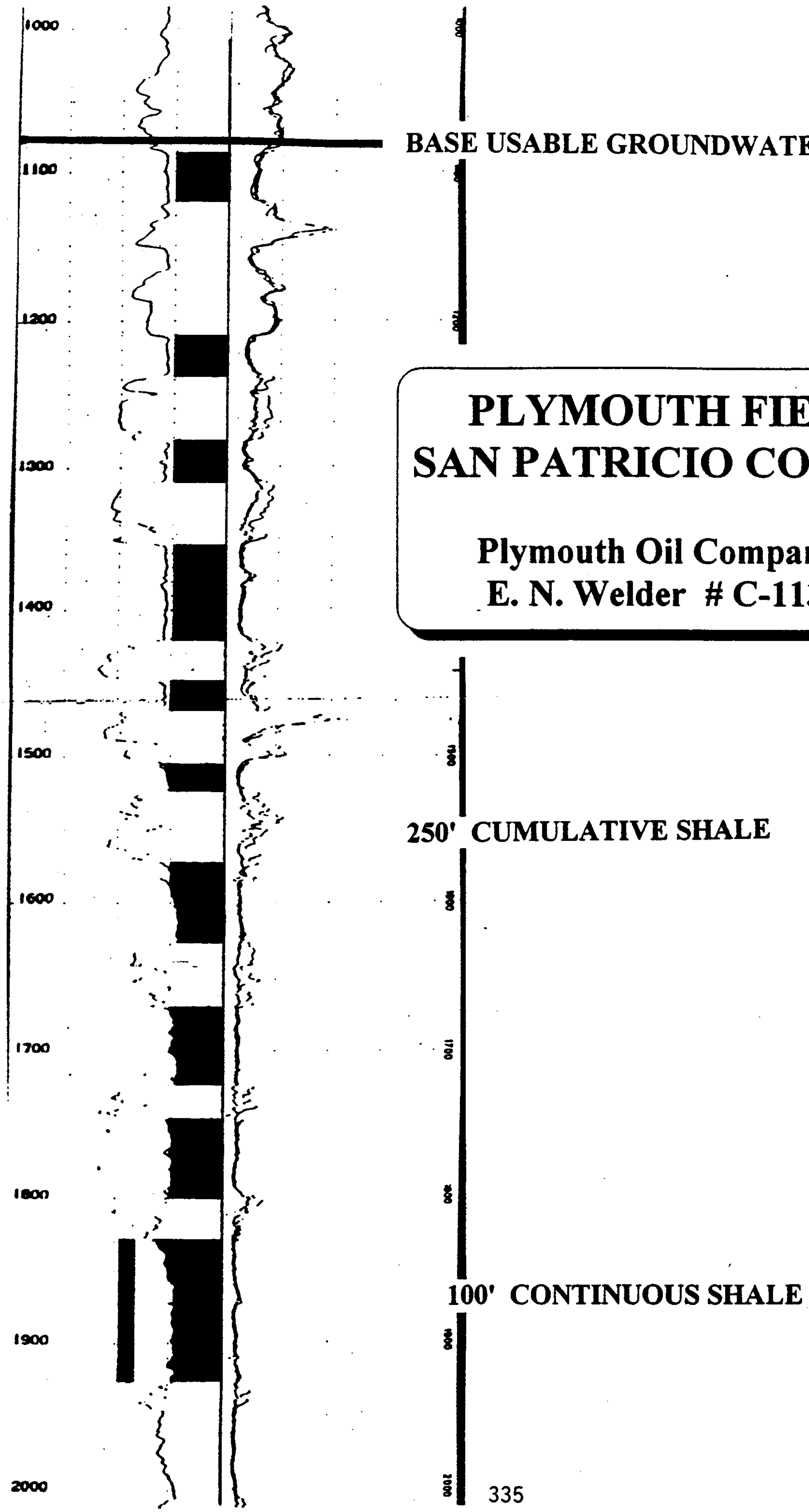

**BASE USABLE GROUNDWATER = 350'**

**100' CONTINUOUS SHALE**

**250' CUMULATIVE SHALE**

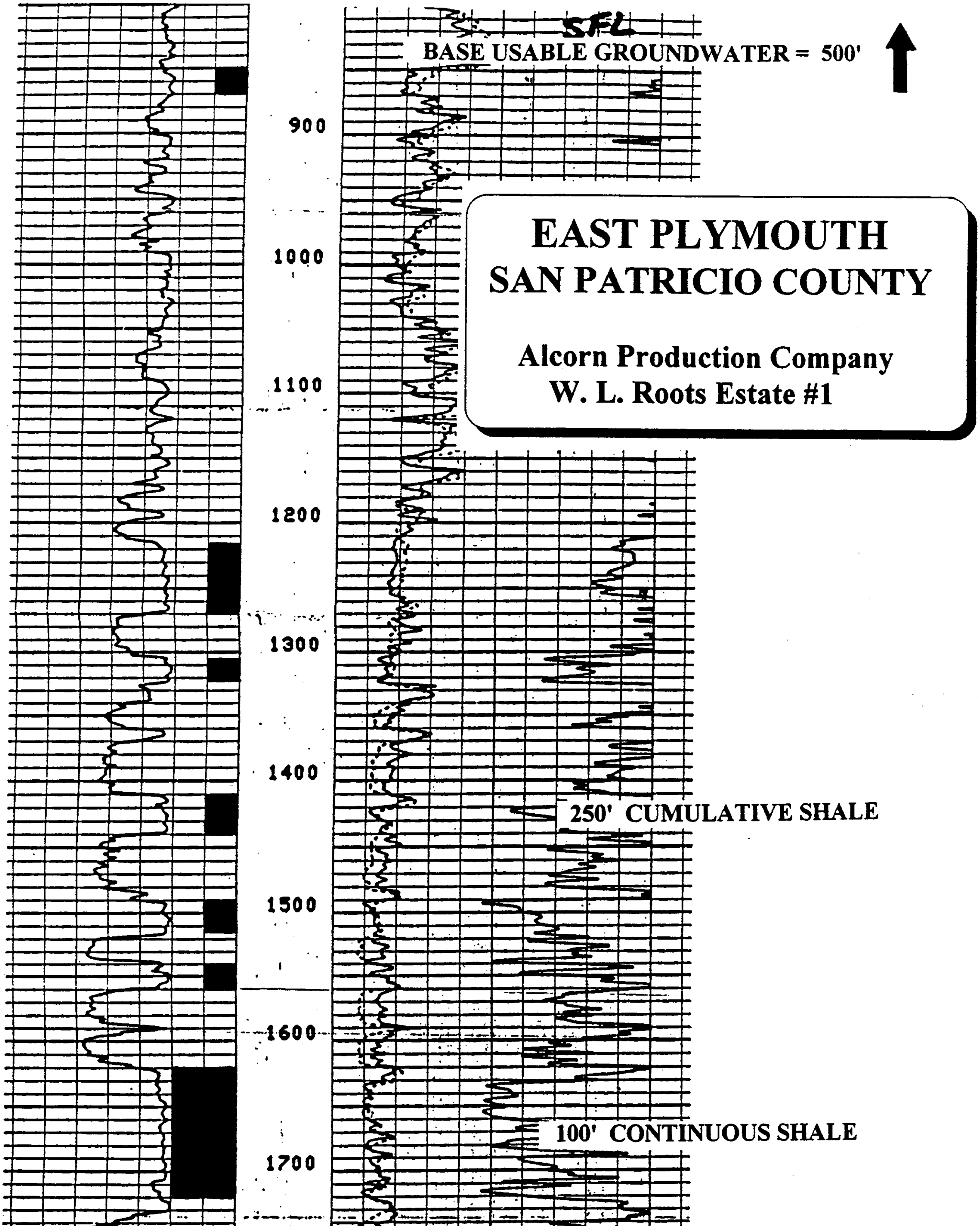
# ODEM FIELD
# SAN PATRICIO COUNTY

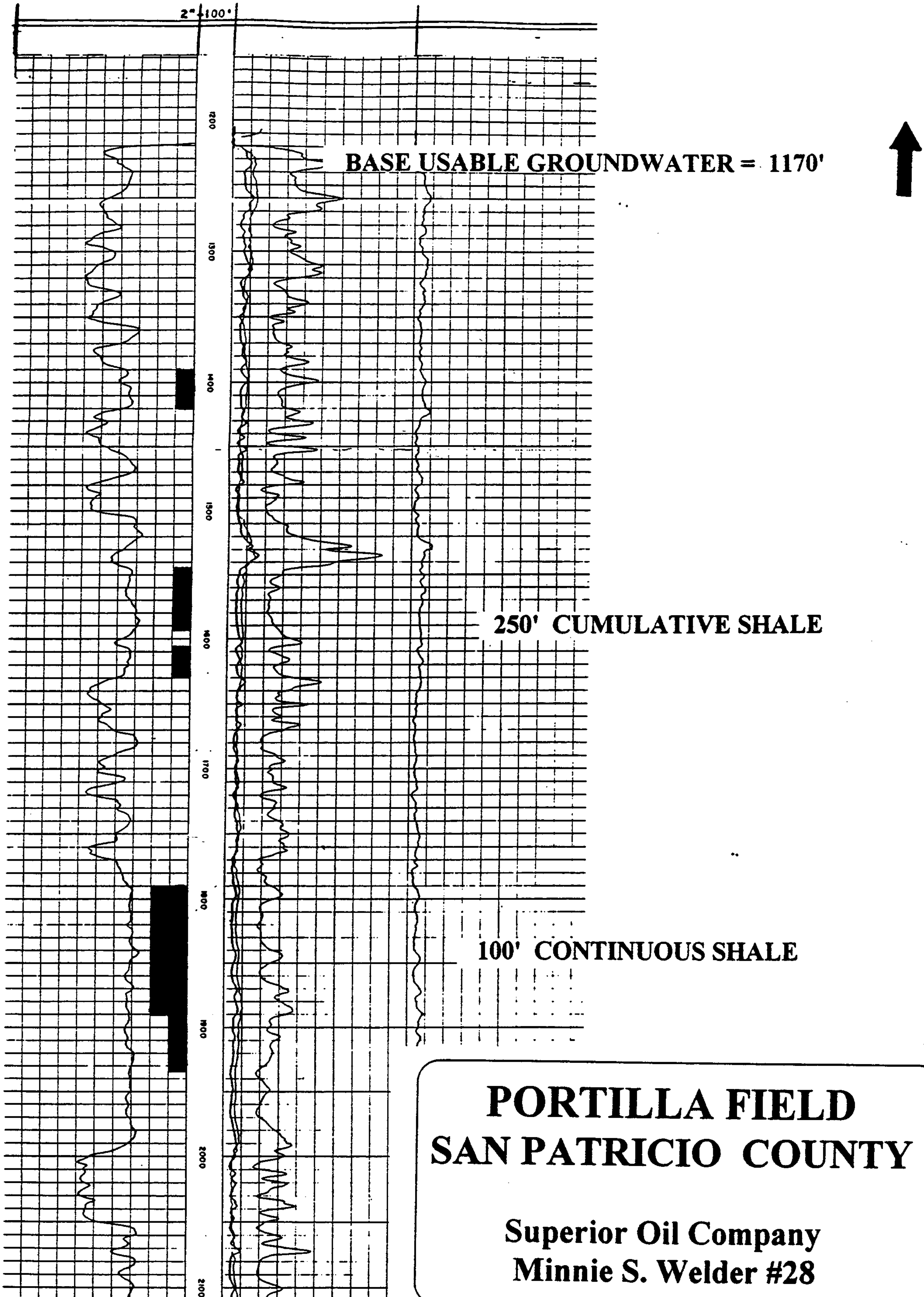
**Seaboard Oil Company**
**N. R. Smith #3**




# PLYMOUTH FIELD
# SAN PATRICIO COUNTY

**Plymouth Oil Company**
**E. N. Welder # C-113**


SFL
BASE USABLE GROUNDWATER = 500'
EAST PLYMOUTH
SAN PATRICIO COUNTY
Alcorn Production Company
W. L. Roots Estate #1
900
1000
1100
1200
1300
1400
1500
1600
1700
250' CUMULATIVE SHALE
100' CONTINUOUS SHALE

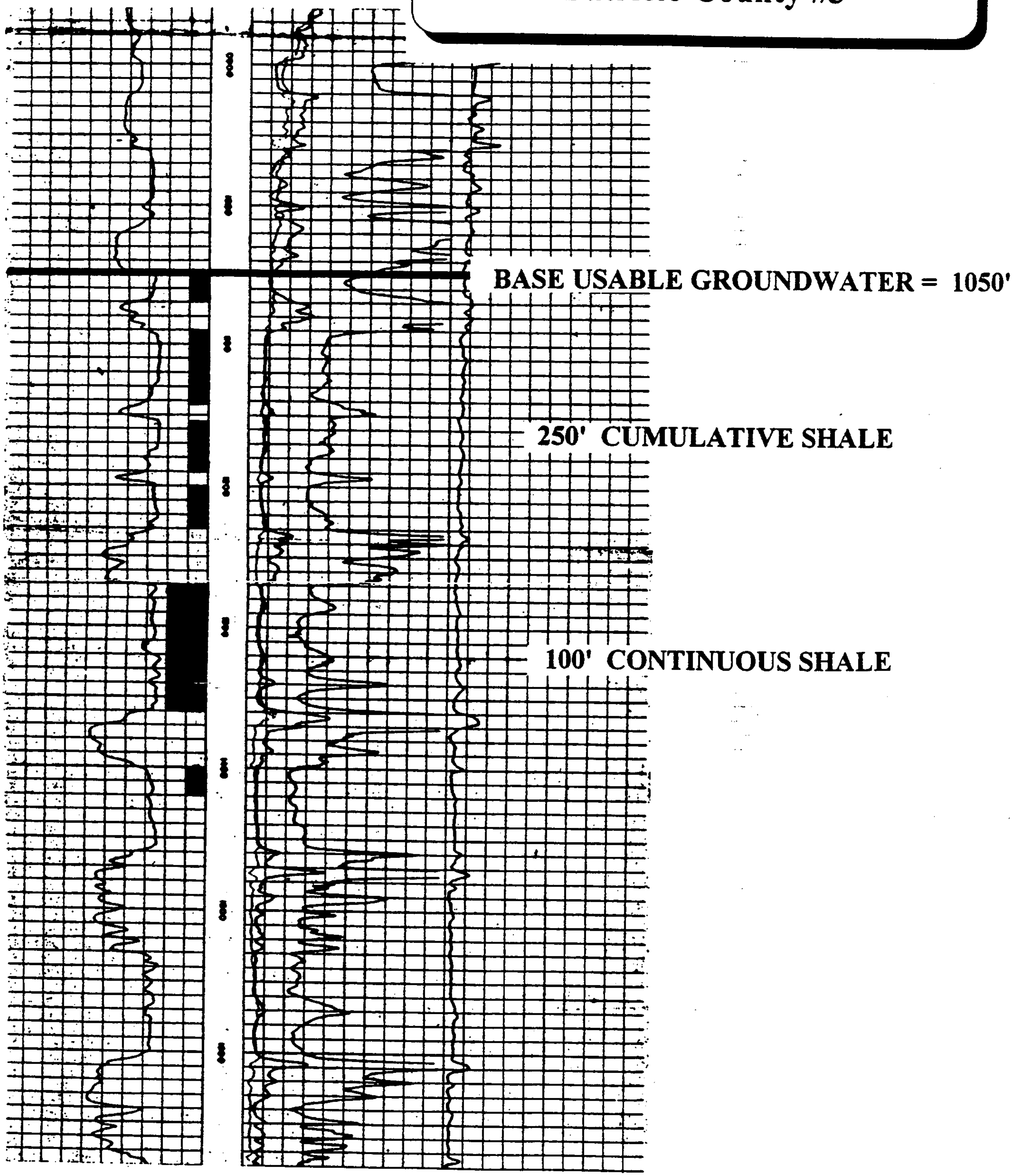


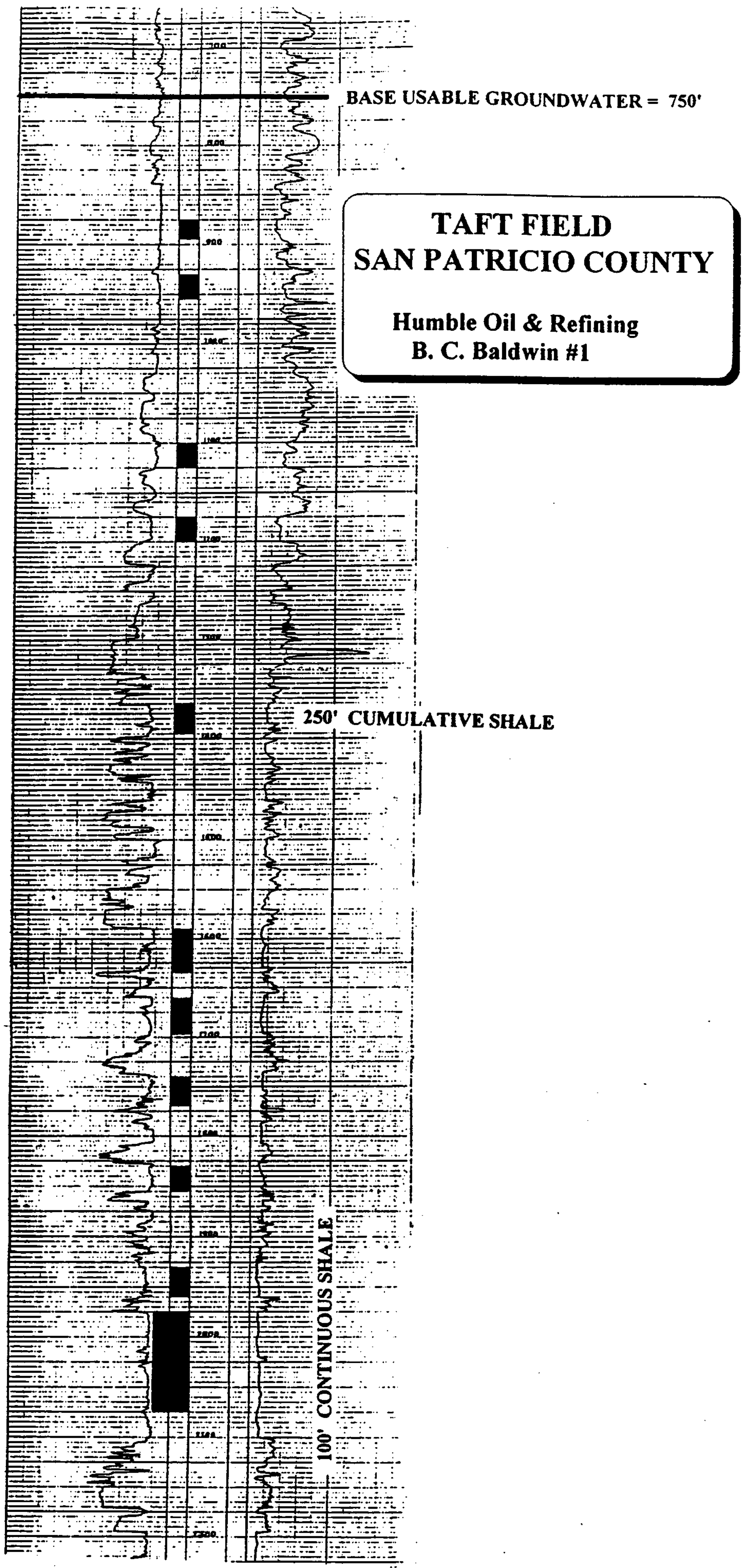

# PORTILLA FIELD
## SAN PATRICIO COUNTY

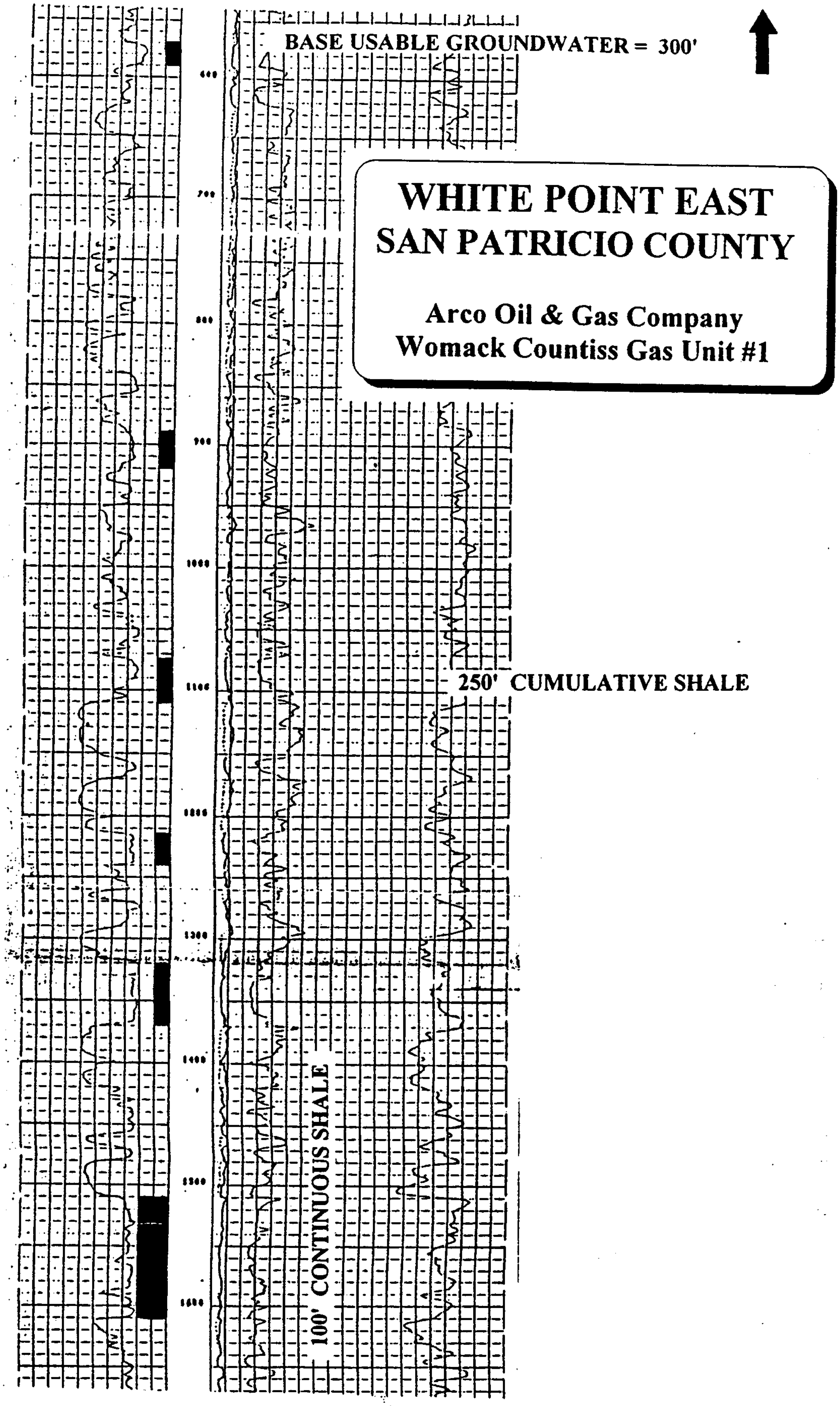
**Superior Oil Company**
**Minnie S. Welder #28**

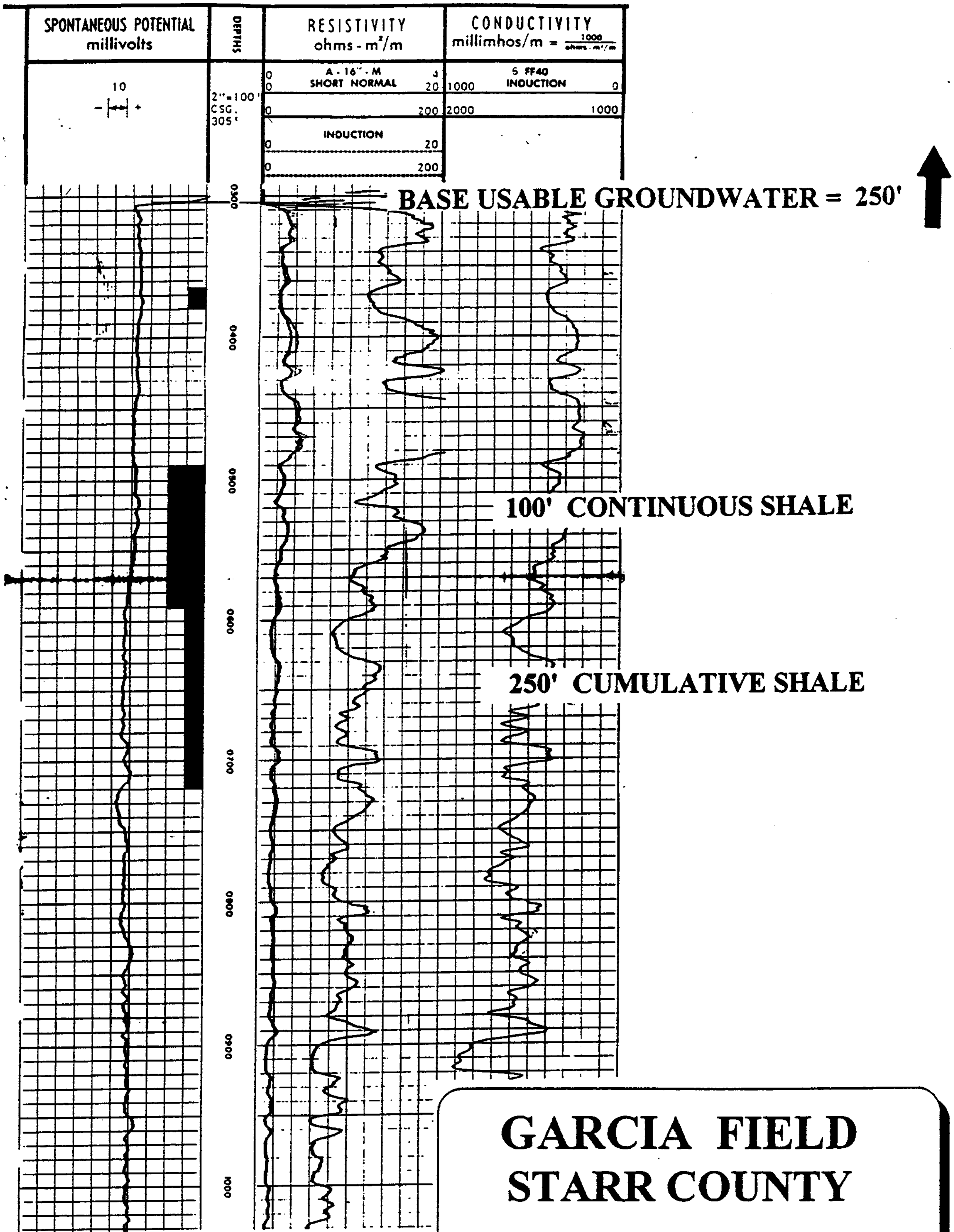
# SINTON WEST FIELD
# SAN PATRICIO COUNTY

**Armstrong & Sutton**
**San Patricio County #3**



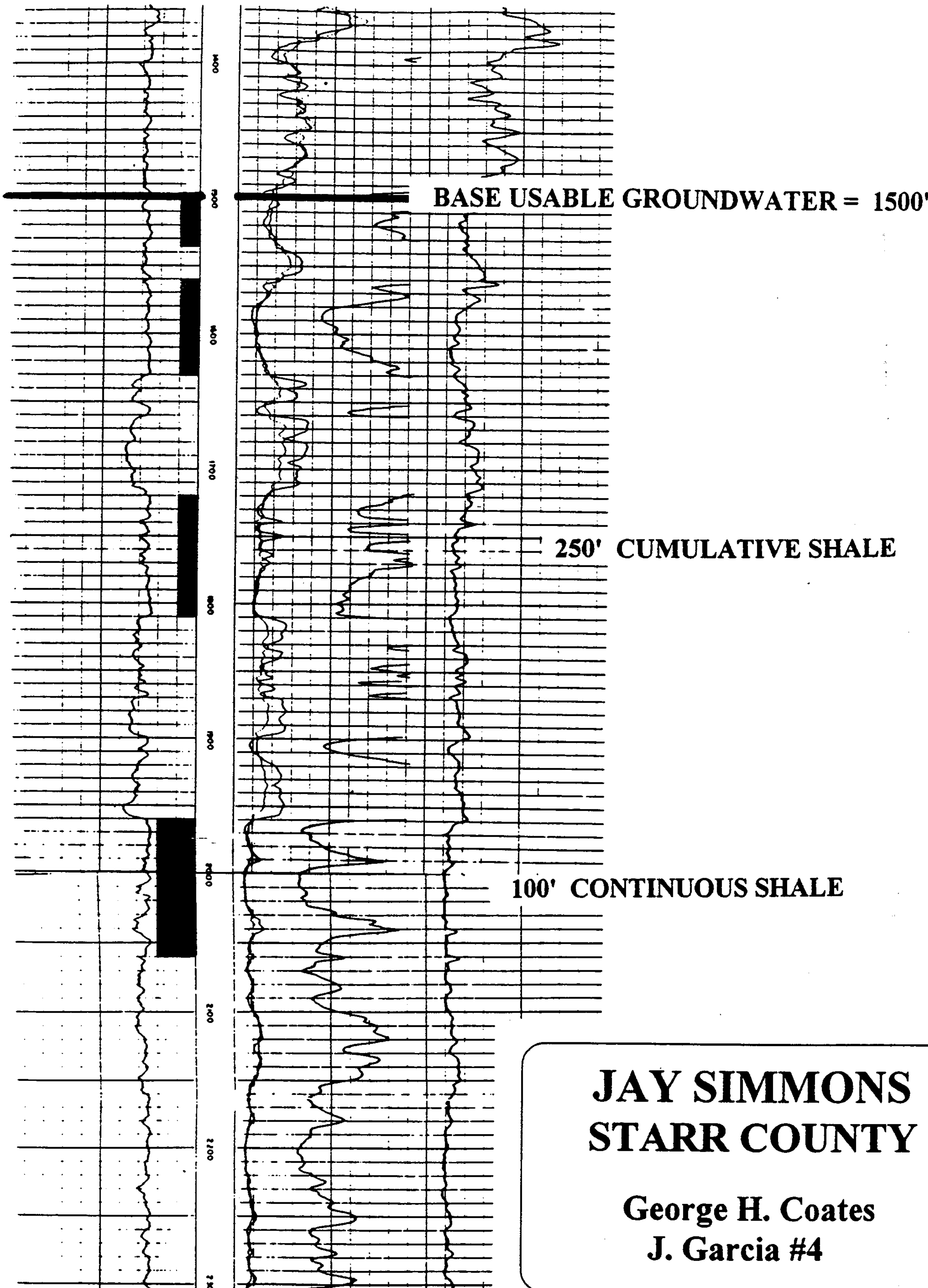

BASE USABLE GROUNDWATER = 750'
TAFT FIELD
SAN PATRICIO COUNTY
Humble Oil & Refining
B. C. Baldwin #1
250' CUMULATIVE SHALE
100' CONTINUOUS SHALE


BASE USABLE GROUNDWATER = 300'
WHITE POINT EAST
SAN PATRICIO COUNTY
Arco Oil & Gas Company
Womack Countiss Gas Unit #1
250' CUMULATIVE SHALE
100' CONTINUOUS SHALE



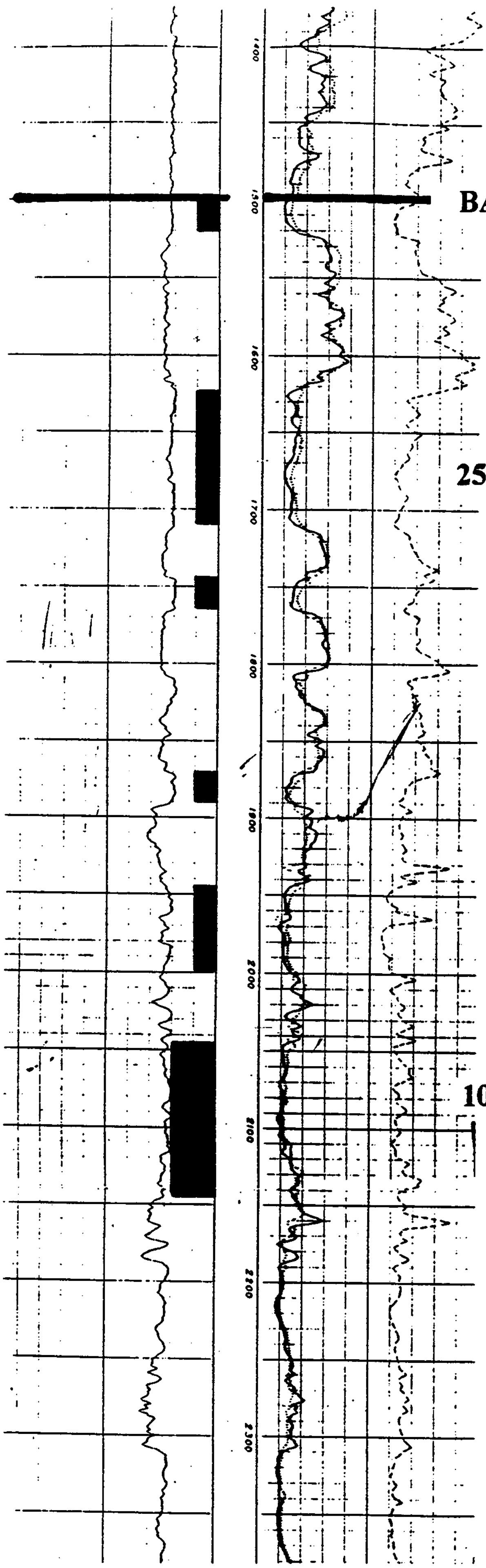

# GARCIA FIELD
# STARR COUNTY

**Sun Oil Company**
**Frost National Bank "B" #29**



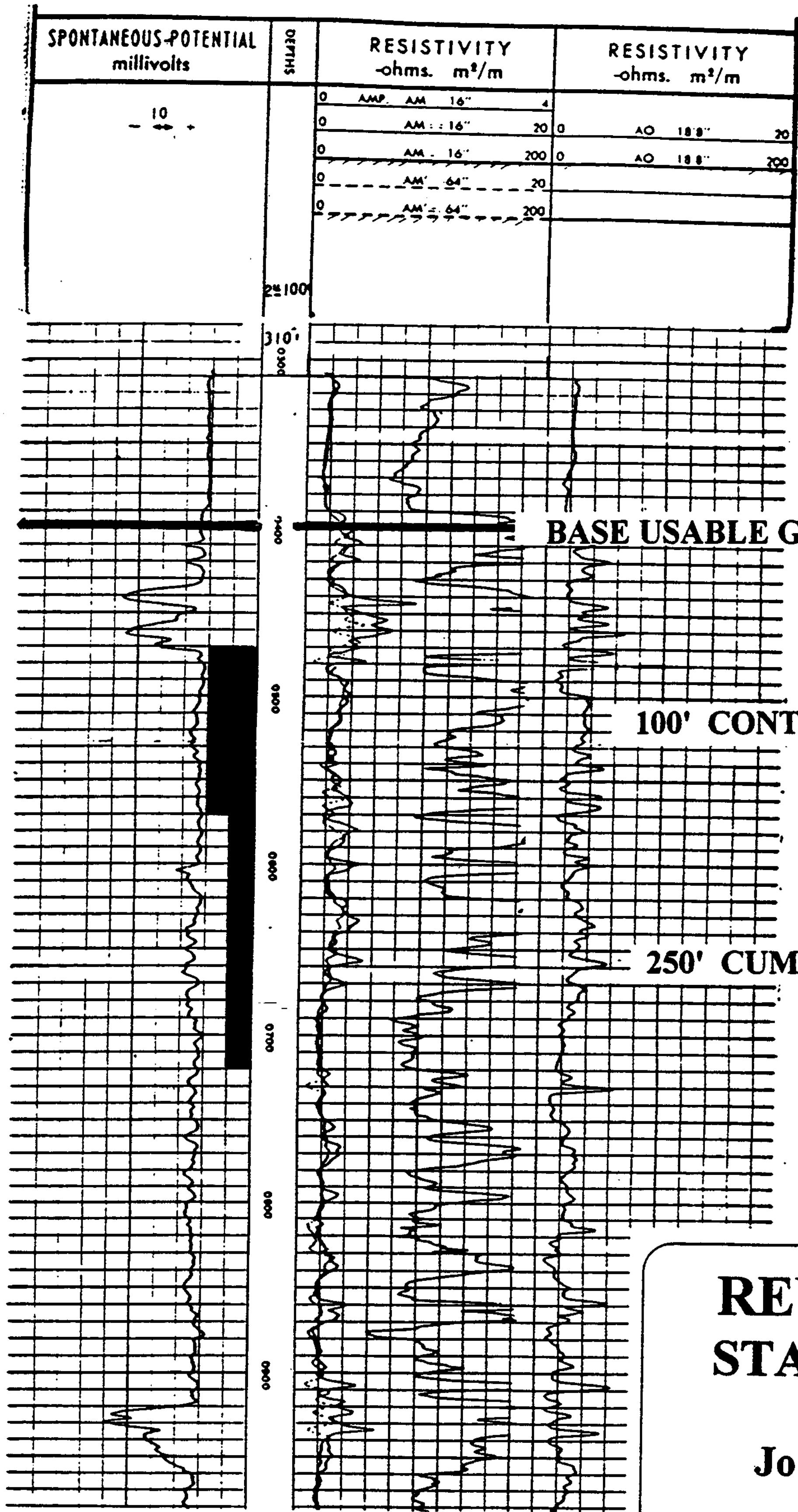

**JAY SIMMONS**
**STARR COUNTY**

**George H. Coates**
**J. Garcia #4**



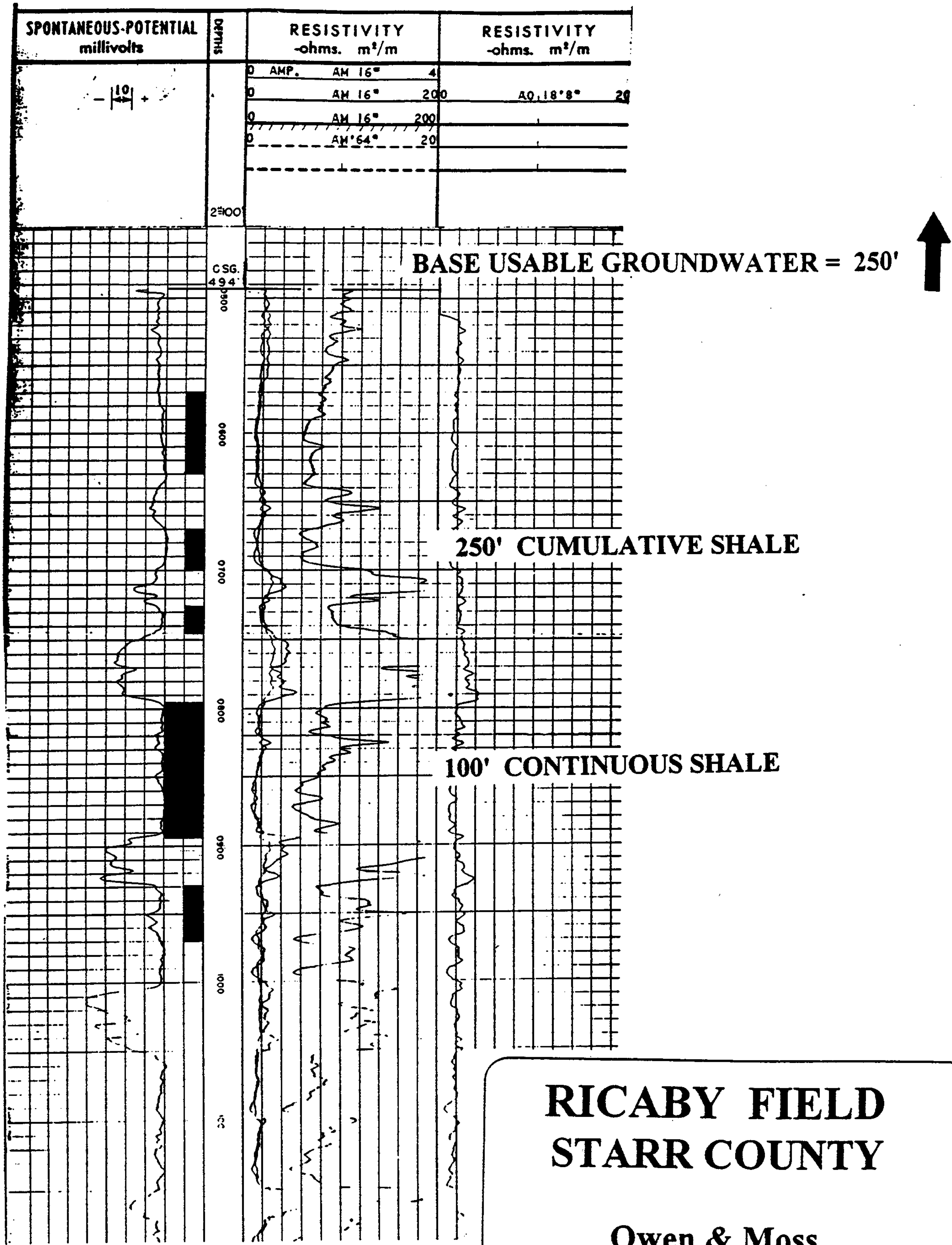

# KELSEY SOUTH
# STARR COUNTY

**J. O. Clark, Jr.**
**Gonzales - Unit #A-5**



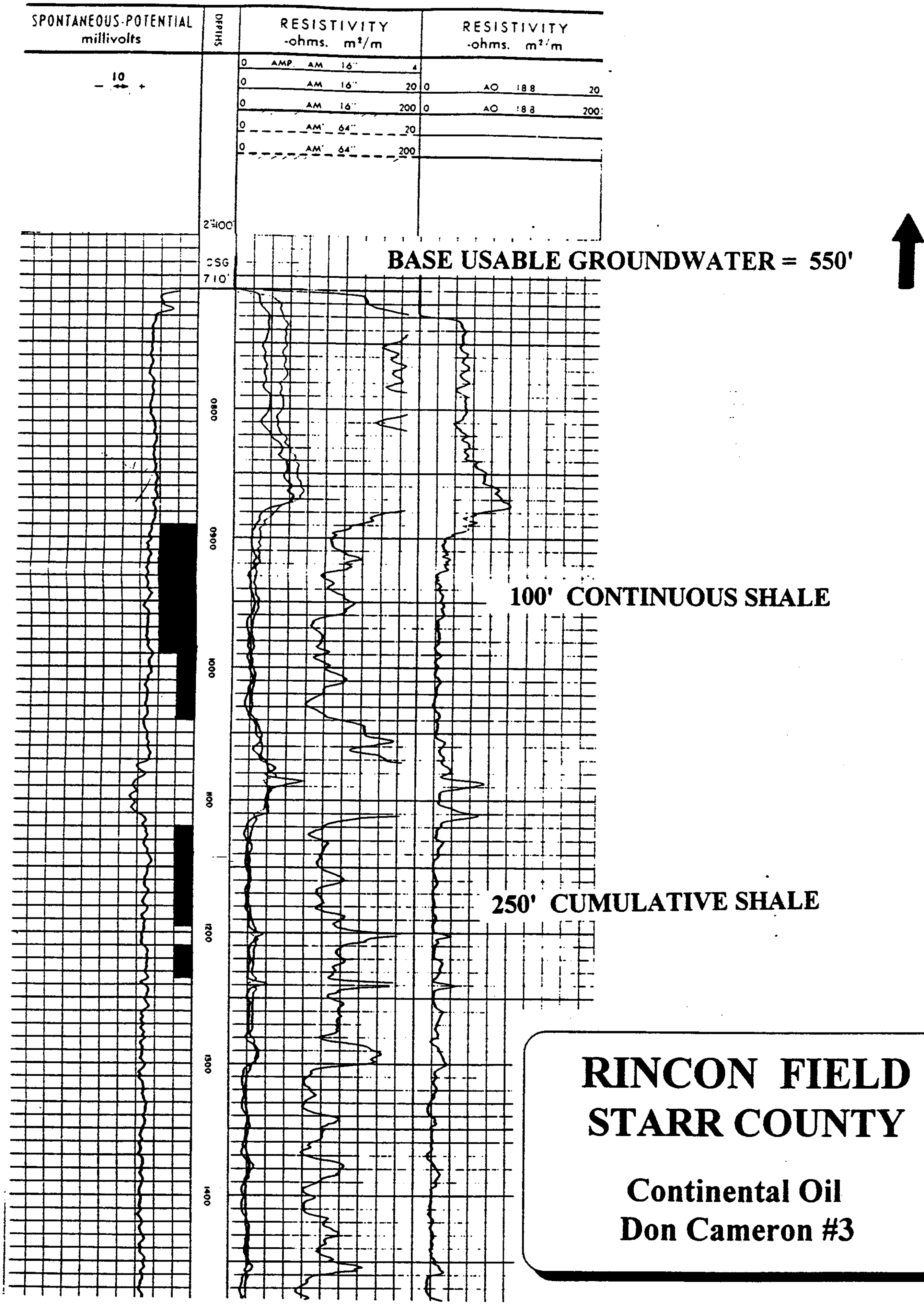

# REYNA FIELD
# STARR COUNTY

**John J. Pichinson**
**Alvarez #1**



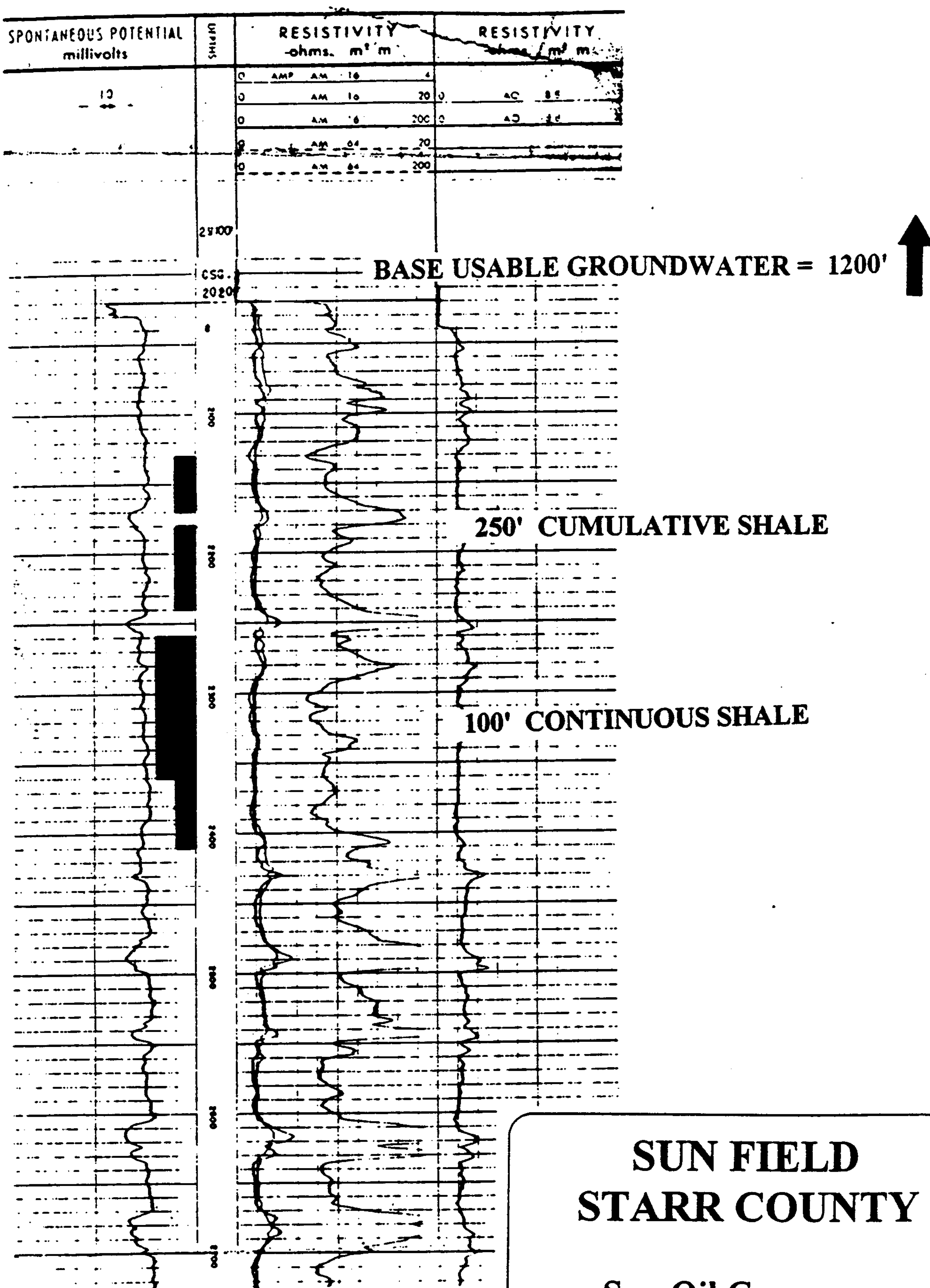

# RICABY FIELD
# STARR COUNTY

**Owen & Moss**
**W. S. Parks #4**



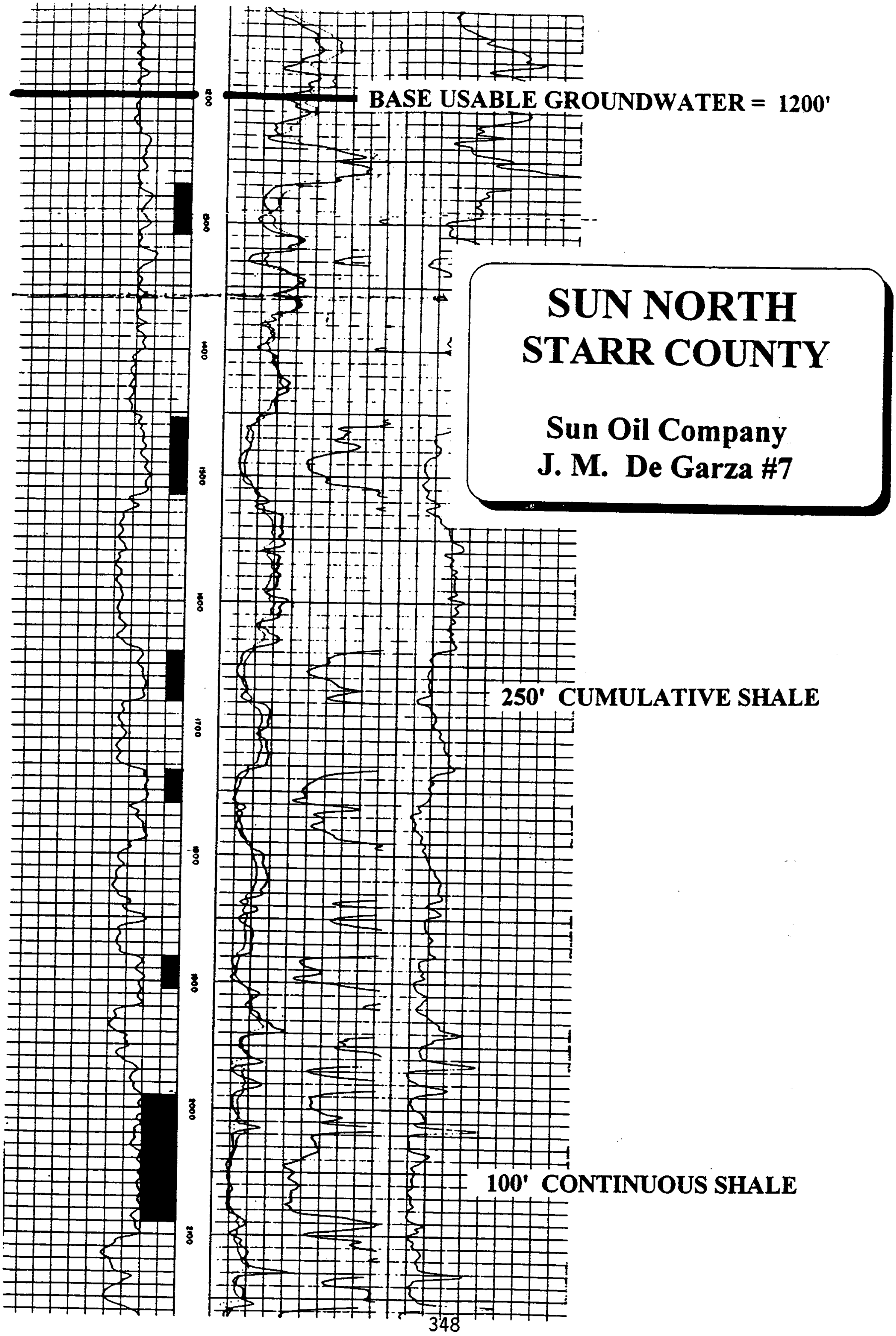

# RINCON FIELD
# STARR COUNTY

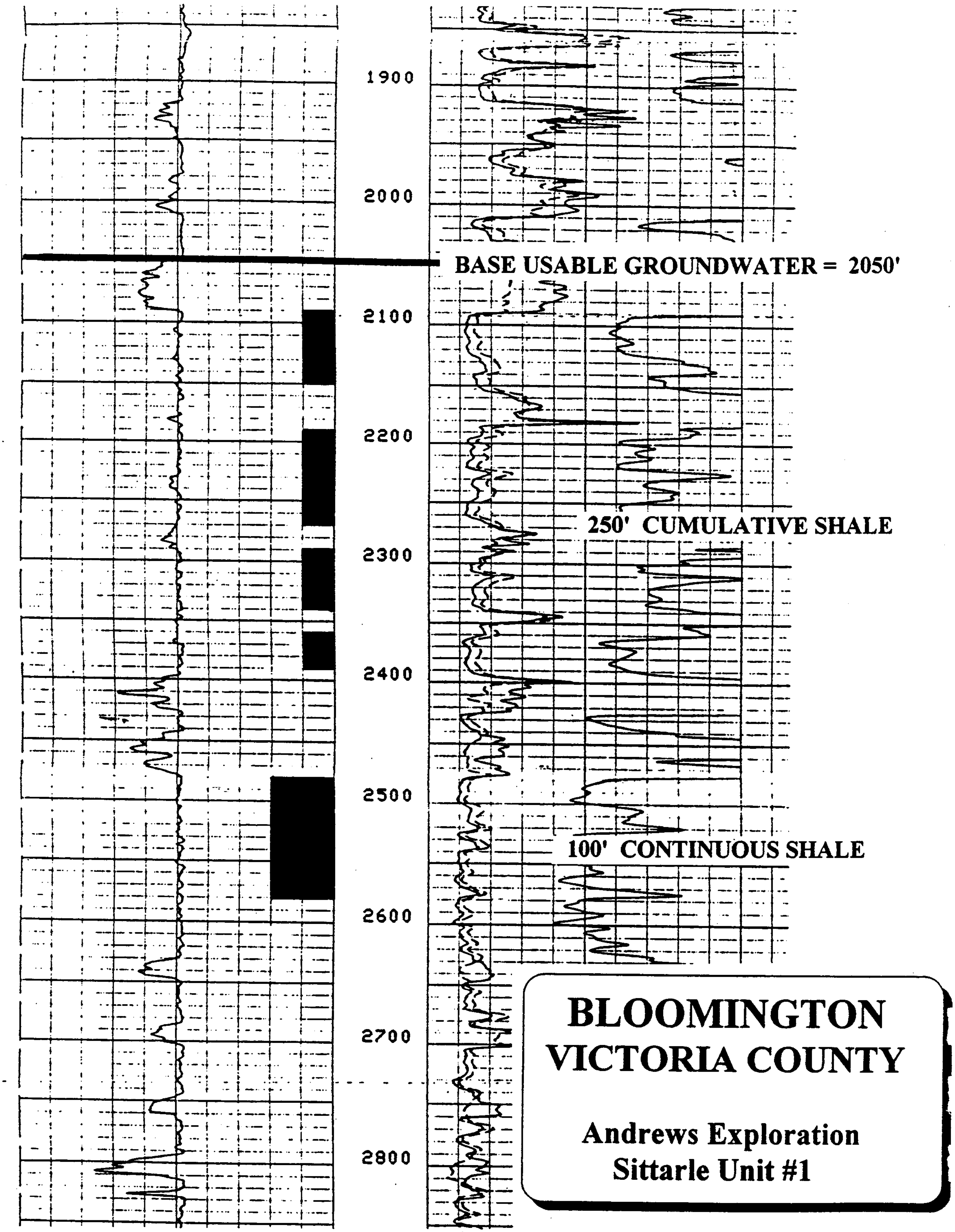
## Continental Oil
## Don Cameron #3




# SUN FIELD
# STARR COUNTY

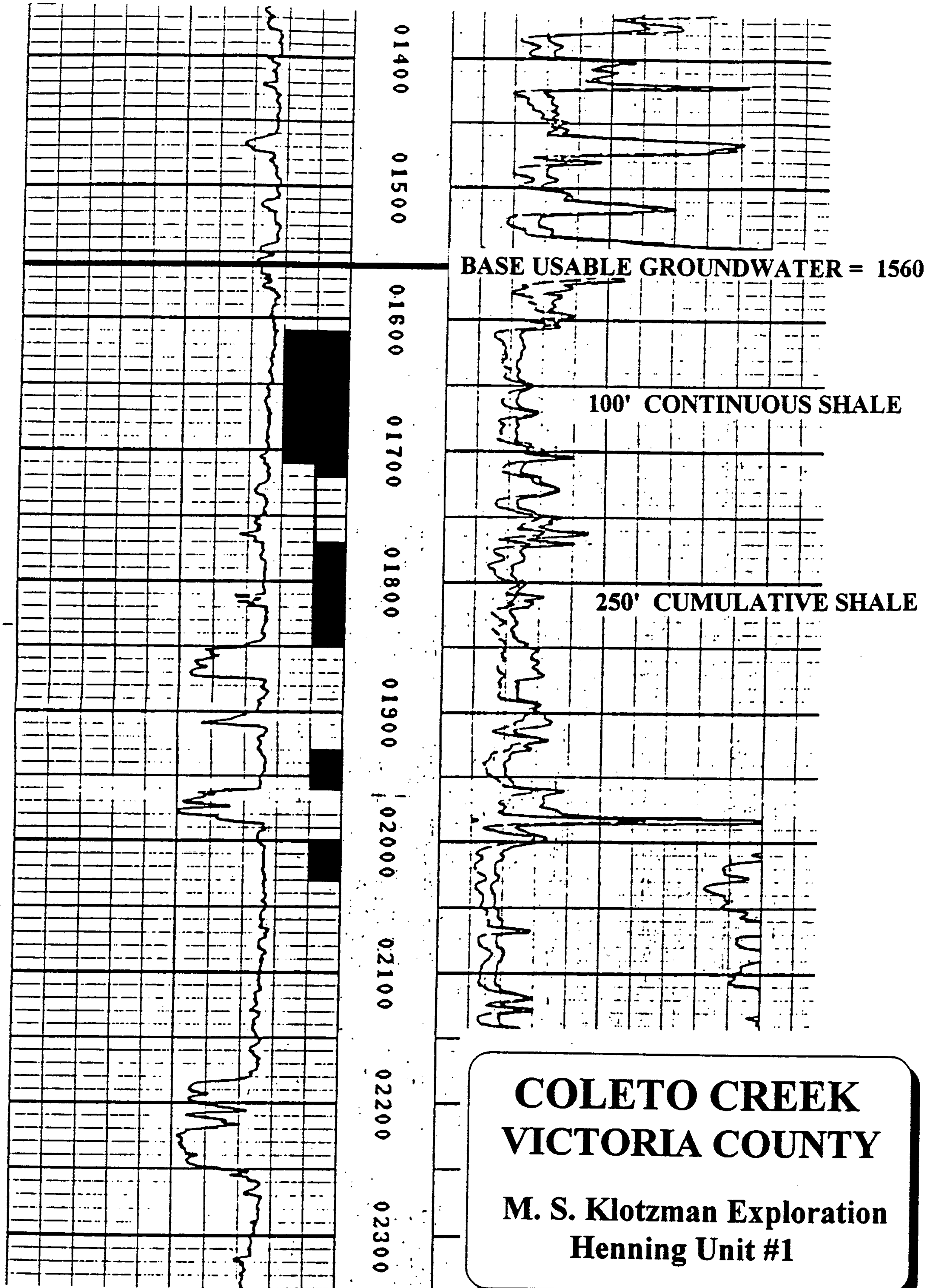
**Sun Oil Company**
**George H. Speer #19**

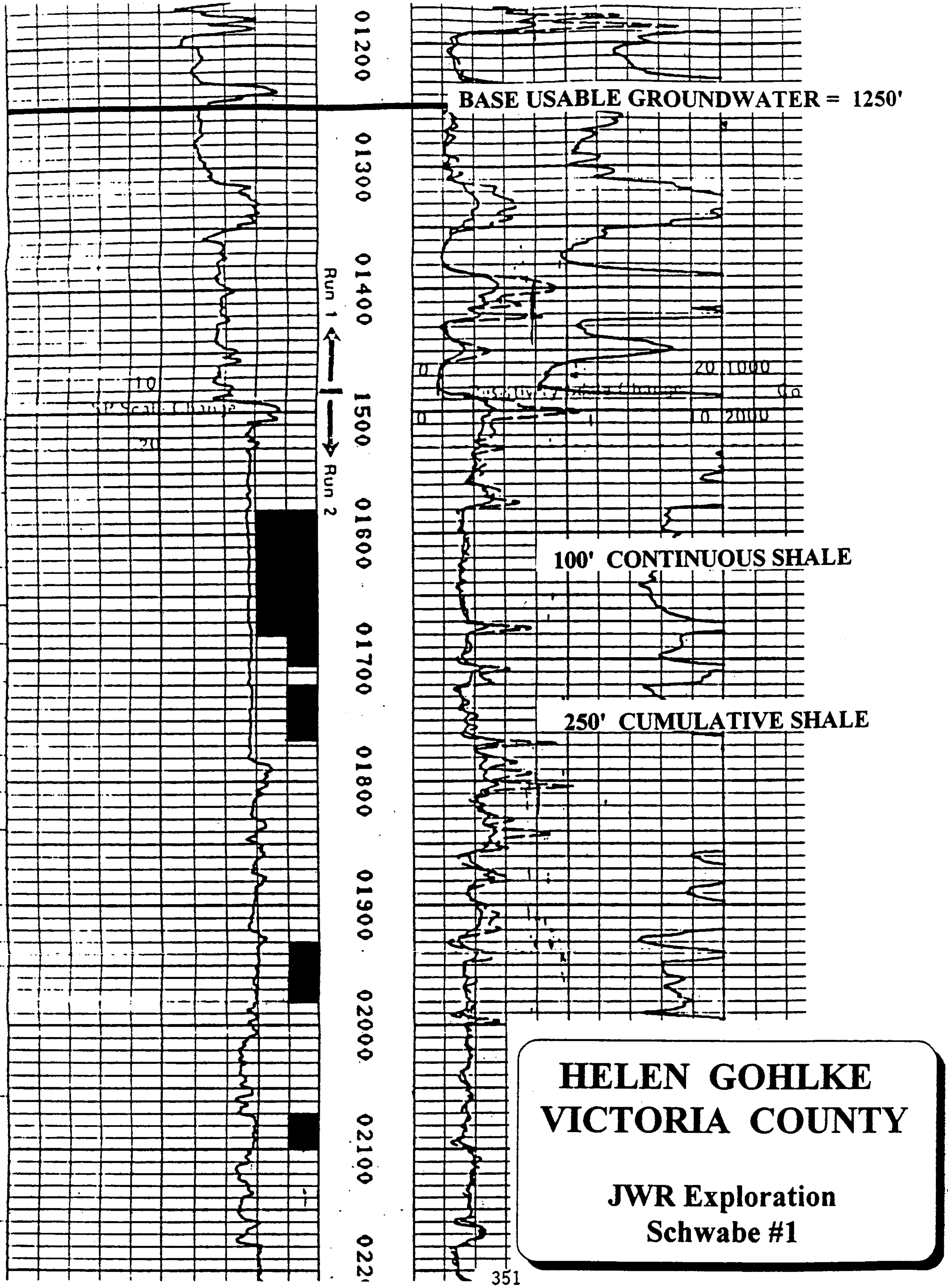

BASE USABLE GROUNDWATER = 1200'
SUN NORTH
STARR COUNTY
Sun Oil Company
J. M. De Garza #7
250' CUMULATIVE SHALE
100' CONTINUOUS SHALE



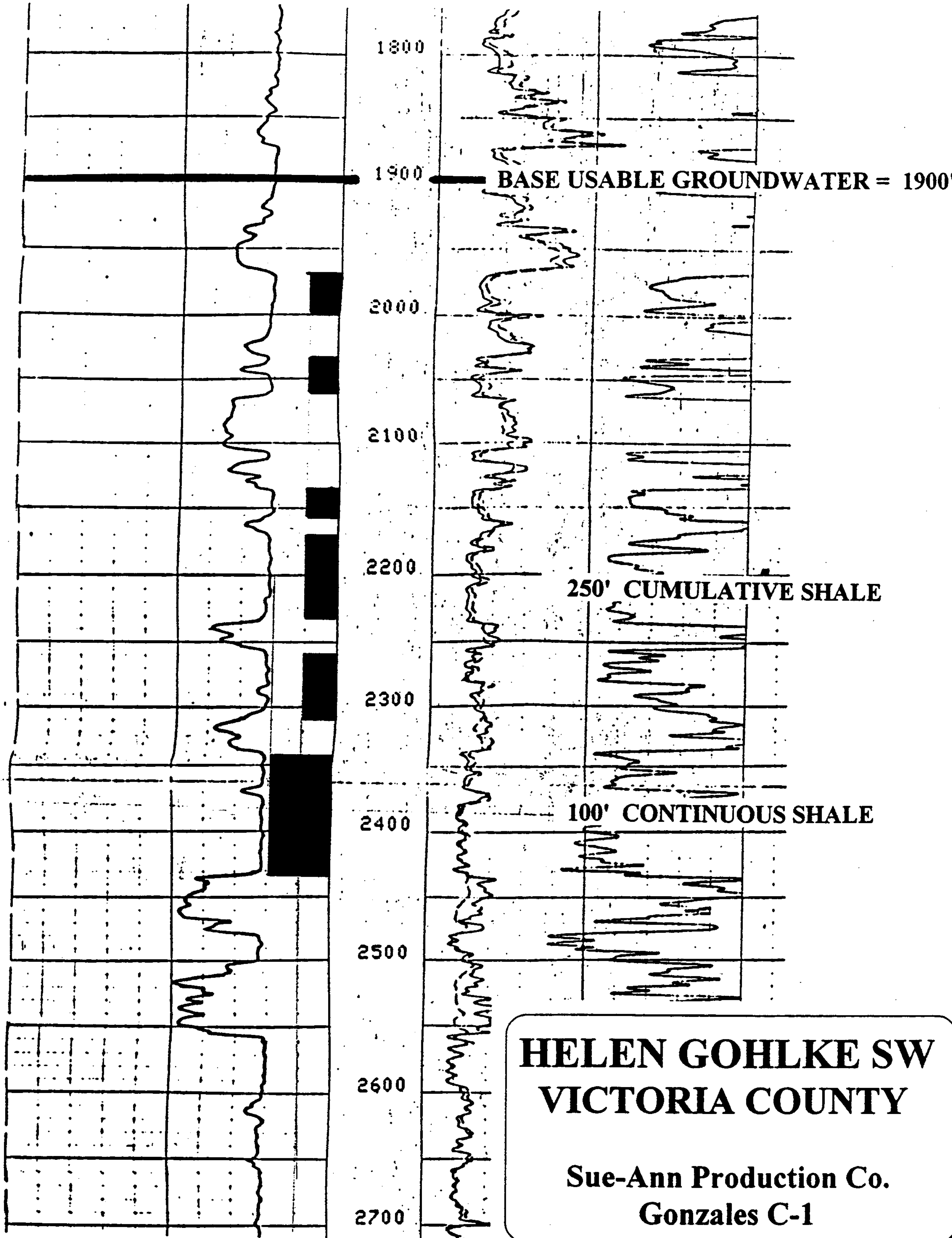

# BLOOMINGTON
# VICTORIA COUNTY

**Andrews Exploration**
**Sittarle Unit #1**


01400
01500
BASE USABLE GROUNDWATER = 1560'
01600
100' CONTINUOUS SHALE
01700
01800
250' CUMULATIVE SHALE
01900
02000
02100
02200
02300
COLETO CREEK
VICTORIA COUNTY
M. S. Klotzman Exploration
Henning Unit #1

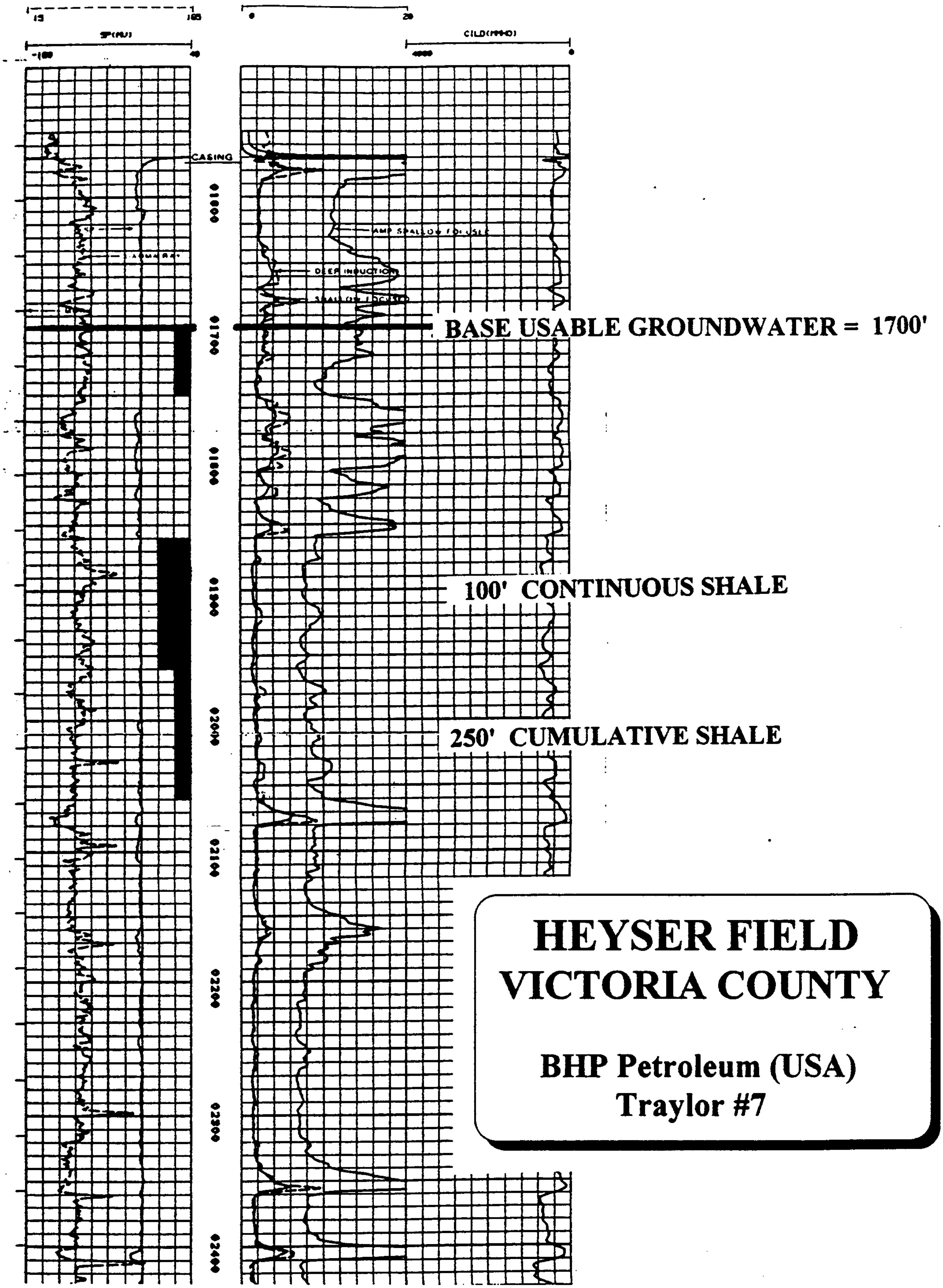


BASE USABLE GROUNDWATER = 1250'
01200
01300
01400
1500
01600
01700
01800
01900
02000
02100
Run 1
Run 2
10
20
0
20 1000
10 2000
100' CONTINUOUS SHALE
250' CUMULATIVE SHALE
HELEN GOHLKE
VICTORIA COUNTY
JWR Exploration
Schwabe #1




# HELEN GOHLKE SW VICTORIA COUNTY

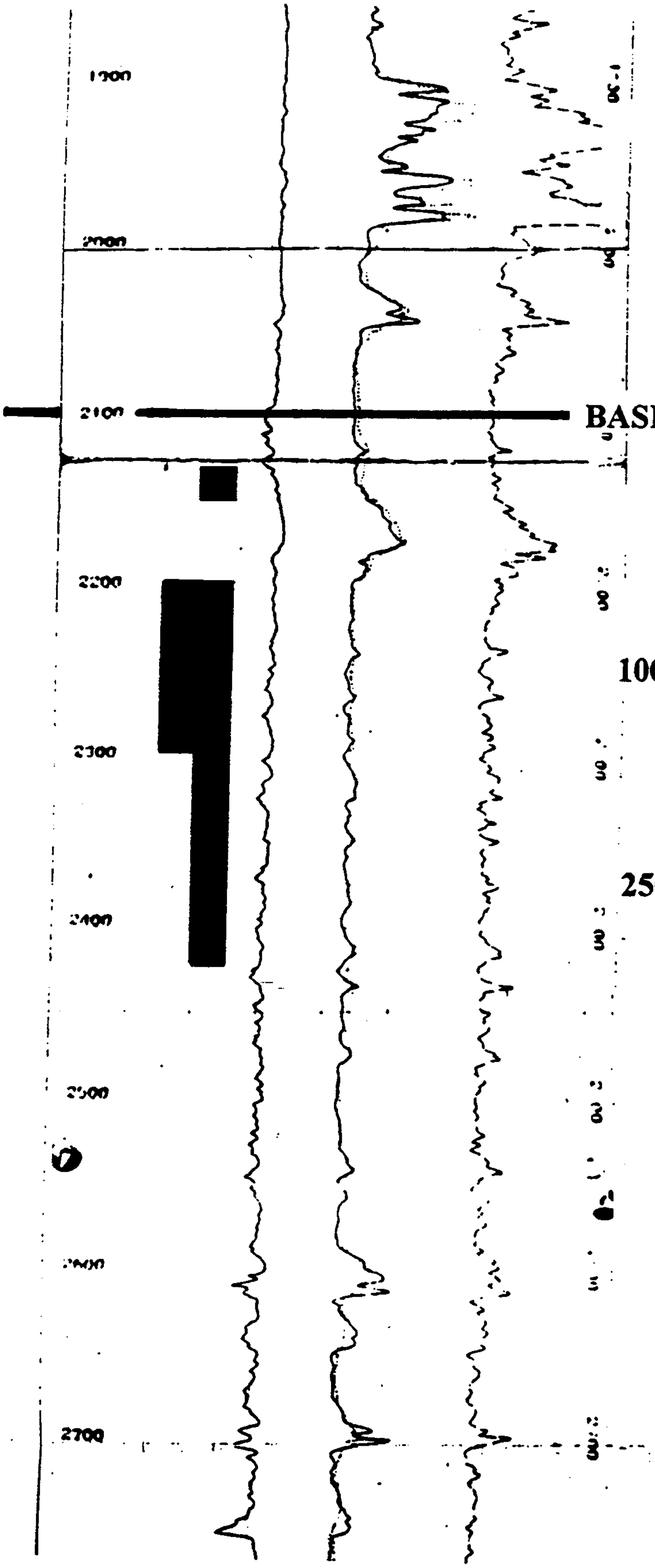
**Sue-Ann Production Co.**
**Gonzales C-1**



SP(MV)
CILD(MMHO)
CASING
DEEP INDUCTION
01600
01700
01800
01900
02000
02100
02200
02300
02400
BASE USABLE GROUNDWATER = 1700'
100' CONTINUOUS SHALE
250' CUMULATIVE SHALE
HEYSER FIELD
VICTORIA COUNTY
BHP Petroleum (USA)
Traylor #7

# KEERAN FIELD
# VICTORIA COUNTY

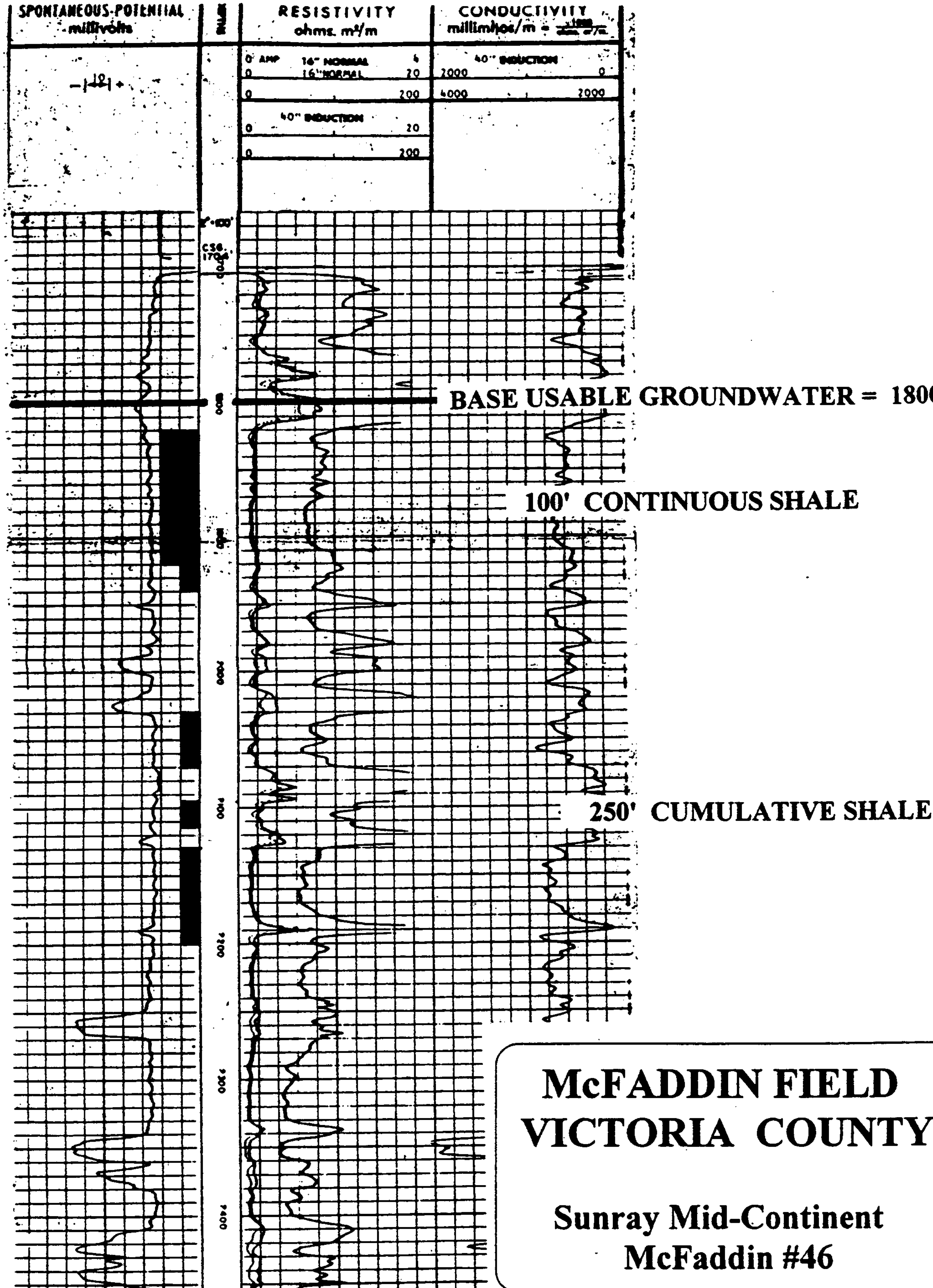
**Barnsdall Oil Company**
**Keeran #A-1**




BASE USABLE GROUNDWATER = 2100'

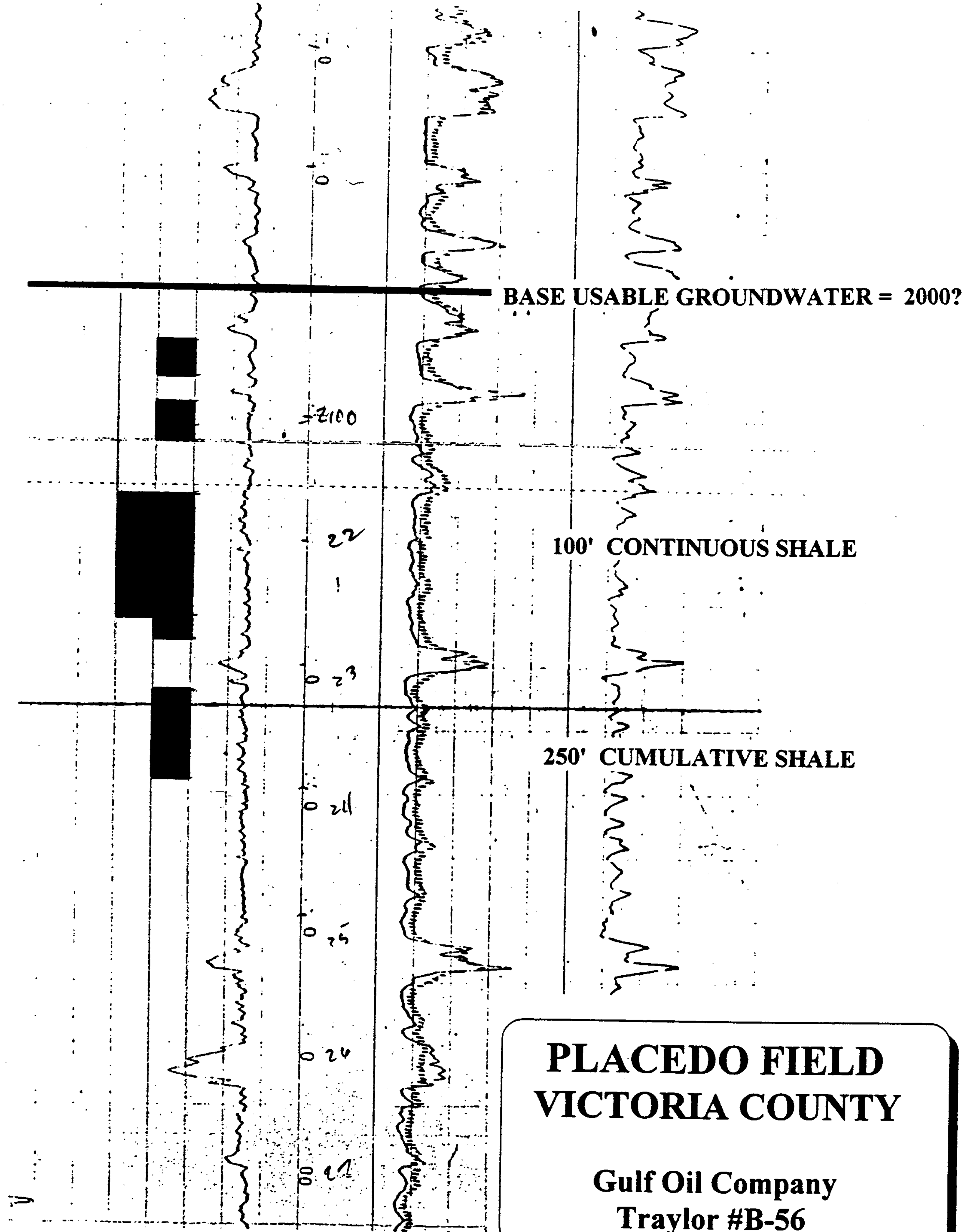
100' CONTINUOUS SHALE

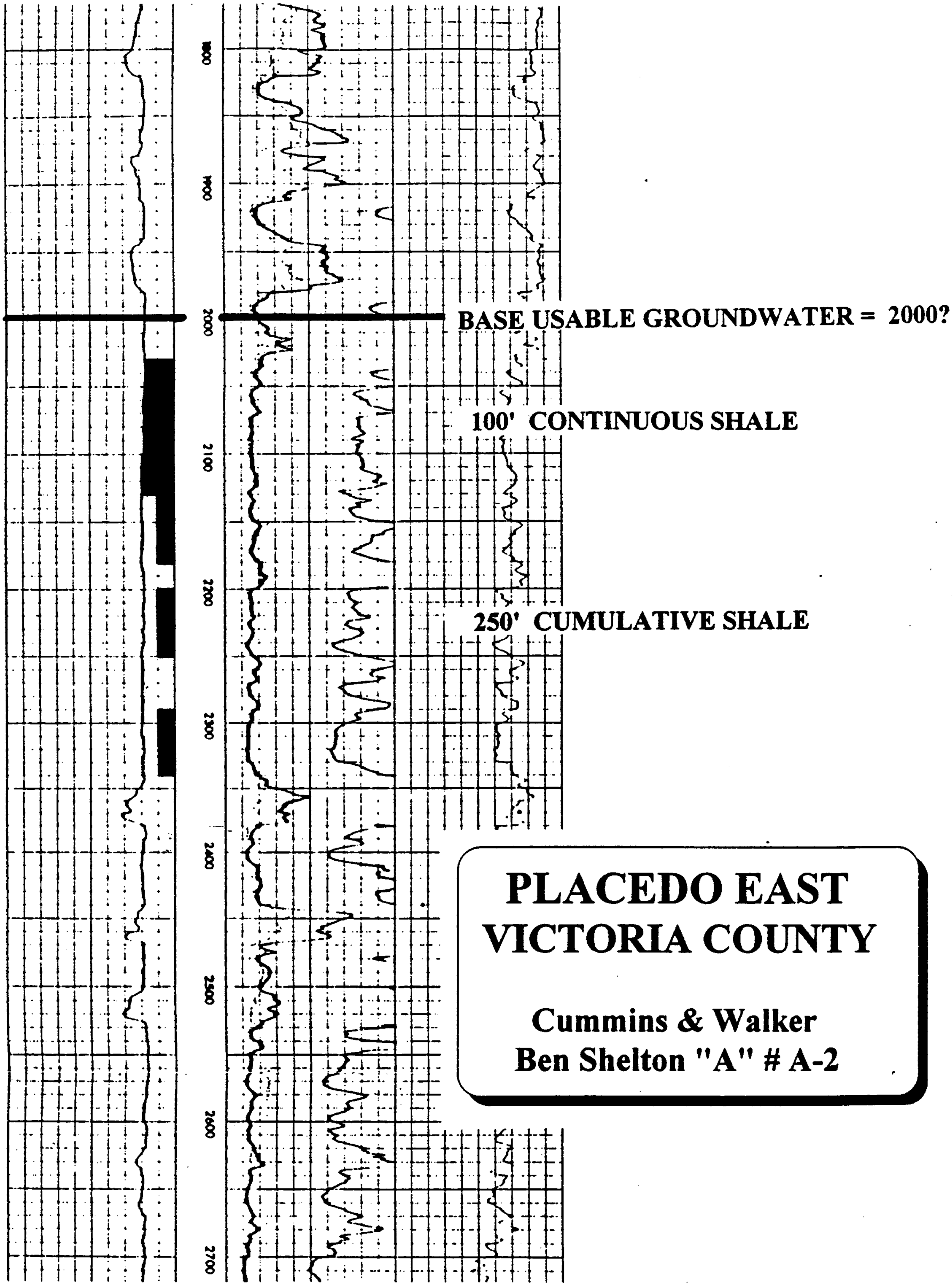
250' CUMULATIVE SHALE




# McFADDIN FIELD
# VICTORIA COUNTY

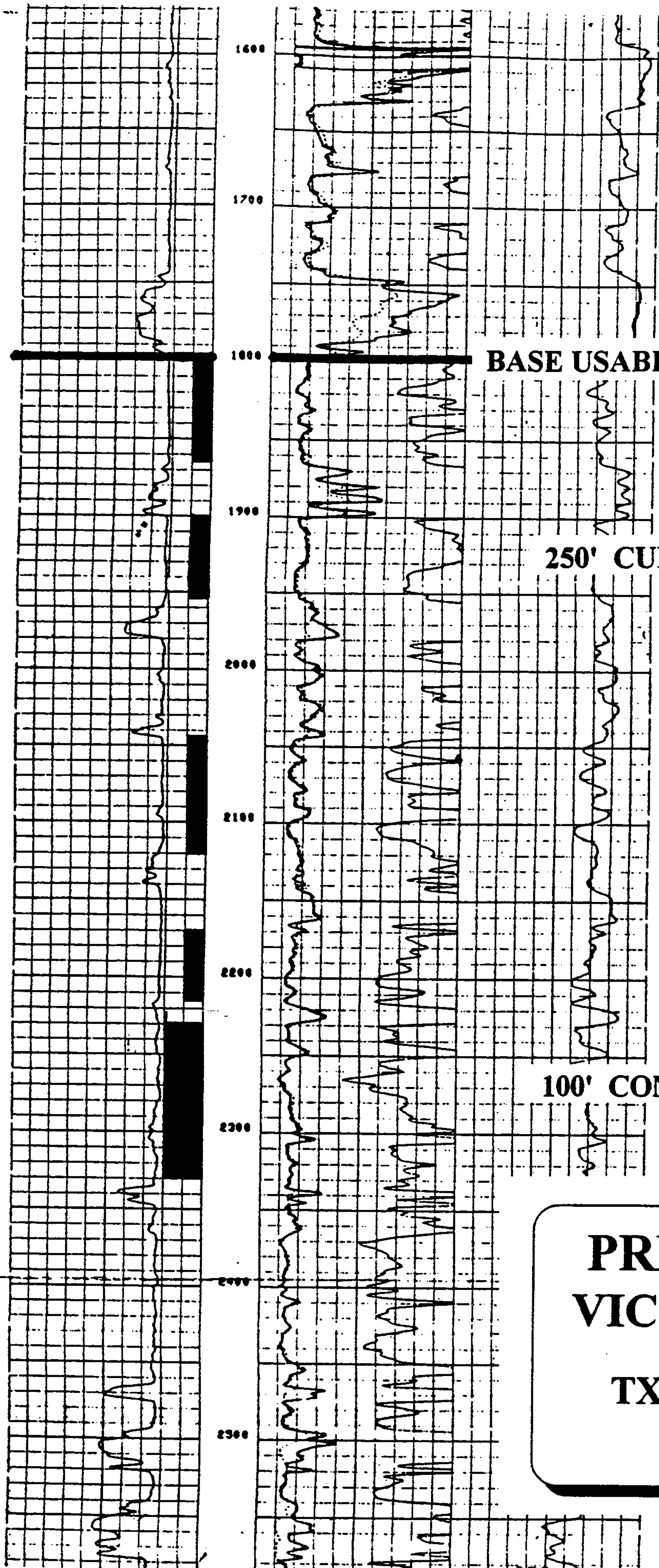
## Sunray Mid-Continent
## McFaddin #46


BASE USABLE GROUNDWATER = 2000?
100' CONTINUOUS SHALE
250' CUMULATIVE SHALE
PLACEDO FIELD
VICTORIA COUNTY
Gulf Oil Company
Traylor #B-56




**PLACEDO EAST**
**VICTORIA COUNTY**

**Cummins & Walker**
**Ben Shelton "A" # A-2**




# PRIDHAM LAKE
# VICTORIA COUNTY

**TXO Production Corp.**
**Simpson G-#3**

# APPENDIX 3

## Gulf Coast Borehole Closure Test Paper

James E. Clark
Corporate Remediation - CHEMICALS
MA 83 - P. O. Box 3269
Beaumont, Texas 77704
(409) 727-9855

January 10, 1995

Mr. Fernando Deleon
Texas Railroad Commission
Environmental Services
Capitol Station
Austin, Texas 78711

RE: Gulf Coast Borehole Closure Test - Orangefield, Texas

Dear Mr. Deleon

Per your request, enclosed is a copy of the DuPont Sabine River Works, Borehole Closure Test which was conducted at Orange, Texas. I have also included a copy of the Gulf Coast Closure Test Well paper. Please feel free to call me at (713) 586-5643 if I can answer any questions concerning the enclosed material or be of further assistance to you.

DuPont Environmental Remediation Services

Phil Papadeas/aa

Phil Papadeas
Senior Geologist

PP/aa
"ENCL"

# SOLUTION MINING RESEARCH INSTITUTE

812 MURIEL STREET
WOODSTOCK, ILLINOIS 60098
815-338-8579

MEETING PAPER


## GULF COAST BOREHOLE CLOSURE TEST WELL
## ORANGEFIELD, TEXAS

by


J. E. Clark, P. W. Papadeas, D. K. Sparks, R. R. McGowen

E. I. du Pont de Nemours & Co., Inc.
P. O. Box 3269
Beaumont, Texas 77704



Presented at Solution Mining Research Institute Meeting

October 27 - 29, 1991 - Las Vegas, Nevada

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# GULF COAST BOREHOLE CLOSURE TEST WELL ORANGEFIELD, TEXAS

J. E. Clark, P. W. Papadeas, D. K. Sparks, R. R. McGowen

E. I. du Pont de Nemours & Co., Inc.
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## ABSTRACT

A borehole closure protocol for a Gulf Coast site near Orangefield, Texas was developed by Du Pont. These procedures were based largely upon recommendations provided by EPA Region 6 and created a borehole closure test to demonstrate that, under a worst case scenario, any artificial penetration will seal naturally. The borehole closure test successfully demonstrated natural sealing. Within one week of setting the screen, tubing and pressure transducers in the borehole, testing confirmed the absence of upward movement of fluid from the test sand. The documentation for the absence of upward movement included: 1) Schlumberger Water Flow Log* and 2) the absence of pressure response on the upper transducer located outside the tubing and inside the casing. Testing was conducted in accordance using specified procedures, with pressure testing conducted at even higher pressures to allow an added margin of confidence. The borehole closure test provides a significant additional margin of confidence that there will be no migration of hazardous constituents from the injection zone for as long as the waste remains hazardous.

## INTRODUCTION

The borehole closure study was conducted to address concerns associated with the movement of injected fluids toward the Orange Salt Dome from the injection wells operated at the Du Pont Sabine River Works. The borehole closure test well (Orange Petroleum #35 Hagar) is located on the east bank of Cow Bayou on the eastern flank of Orange Salt Dome, east-southeast of the town of Orangefield, Texas (see Figure 1). The study was performed in response to EPA's request for additional information sufficient to demonstrate that, even assuming a worst-case basis that wastes might migrate across the faults at Orange Salt Dome, there would be no migration of hazardous constituents from the injection zone upward through artificial penetrations.

*Mark of Schlumberger

Previous studies (Johnston and Greene. 1979: Davis. 1986: Johnston and Knappe 1986: Clark et al.. 1987) have reported qualitatively that wells drilled in unconsolidated (soft) rock. such as the Gulf Coastal Plain in Texas. experience natural borehole closure. This study was developed by Du Pont for a quantitative analysis on natural borehole closure and was based upon recommendations provided by EPA. The worst-case scenario developed for this study included: 1) a test interval within the injection zone consisting of a thin injection sand overlain by a thick. sand-free shale: 2) an open borehole with a diameter equal to the largest hole diameter expected to be encountered among the abandoned wells at Orange Salt Dome. 3) a mud program designed in accordance with drilling practices in general use at the time the abandoned boreholes in question were drilled (1919). and 4) actual testing with a 9.0 lb/gal brine since this is the worst-case condition for abandoned holes without plugging records. The test protocol provided that the test would be successful if. when a 100 psi pressure increase was applied, a Water Flow Log or oxygen activation (OA) log run at stations above the injection sand interval showed no upward channeling and an upper pressure transducer showed no pressure buildup.

The maximum calculated value for potential pressure increase at this site is <80 psi, which includes all possible sources of pressure increase: 1) maximum density contrast between natural formation fluid and the injected waste (0.075) and 2) a worst-case density drive if the plume extended from the plant to the dome (maximum dip 2400 feet). More likely, the long-term effect of buoyancy occurs where the plume has drifted from the plant to the dome and the number of feet of dip is considerably less, only 300 feet. In the latter case. the pressure due to buoyancy would be <10 psi. Thus. testing the borehole closure well to 100 psi increase is an extremely conservative approach.

If an artificial penetration had been abandoned with casing in place. the casing would corrode. thus 'exposing' whatever was in the borehole to the formation. This corrosion information was based on conservative data from Orange Salt Dome artificial penetration data and National Association of Corrosion Engineers data (Graver, 1985). Using a maximum casing wall thickness of 0.557 inch for 8 5/8-inch casing and a conservative corrosion rate of 20 mils per year, the casing would corrode in 28 years, which is long before waste reaches Orange Salt Dome in approximately 5,000 years. This value is consistent with casing corrosion data available from producing wells in the Orangefield area.

The geologic formations present at depths of 2000 ft to 8000 ft consist mainly of middle to upper Miocene sands. with lower Oligocene Anahuac Shale. and Frio sands at greater depth (see Figure 2). Tertiary sands and shales were deposited in a series of stacked progradational wedges. which dip and ultimately thicken toward the Gulf of Mexico. The lower Miocene Lagarto and the middle Miocene Oakville Formation are both characterized by very thick, fine to very fine grained sands. silts and shales deposited in a fluvial and deltaic environment. The regional geologic structural setting is one characteristic of salt tectonics. with salt dome intrusions, minor salt ridges and deep synclines. Orange Salt Dome is a piercement type salt dome (top of salt approximately 7000 feet) where considerable quantities of hydrocarbons have been produced since 1919.

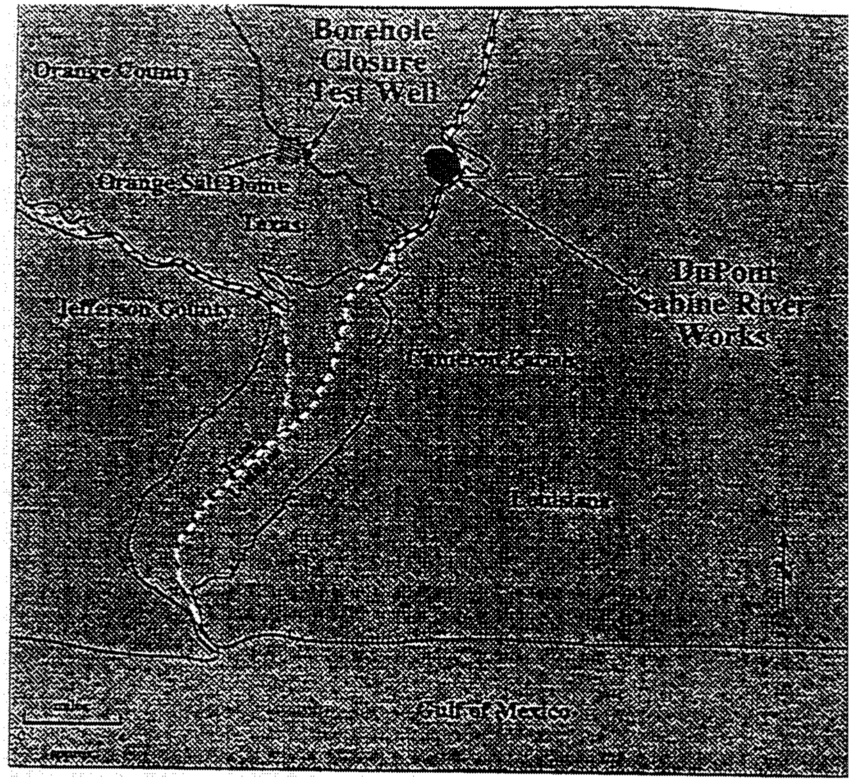


**Figure 1 : Geographic Location Map of the Sabine River Works and the Borehole Closure Test Well**

| *Period* | *Epoch* | *Stage or Group* | *Formation* |
|---|---|---|---|
| QUATERNARY | HOLOCENE | Undifferentiated | |
| | | 12,000 YA | |
| | PLEISTOCENE | Houston<br>L. Wisconsin | Beaumont |
| | | Wisconsin<br>E. Wisconsin | |
| | | Sangamon<br>L. Illinoian | |
| | | Pre-Sangamon<br>E. Illinoian | Lissie |
| | | Yarmouth<br>Kansan | |
| | | Aftonian<br>Nebraskan | Willis |
| | | 2.8 MYA | |
| TERTIARY | PLIOCENE | Citronelle Group | Goliad |
| | | 5.2 MYA | |
| | MIOCENE | Fleming Group | Lagarto |
| | | | Oakville |
| | | 24 MYA | |
| | OLIGOCENE | Catahoula Group | Anahuac |
| | | Vicksburg Group | Vicksburg |
| | | 37 MYA | |

**Figure 2: Stratigraphic Column for Eastern Gulf Coast. Adapted from Jackson and Galloway, 1984.**

## PROCEDURES

Following evaluation and analysis of the mudlog. lithology samples. openhole logs. and visual examination of sidewall cores obtained from the test well. several sand and shale zones were determined to be potential candidates for the test interval. Using the protocol developed by Du Pont with recommendations from the EPA. the criteria for test interval selection called for a thin clean injection sand. overlain by a thick sand-free shale within the injection zone. The injection sand selected contains 30 net feet of clean sand (2932 feet - 2962 feet) with 88 net feet of clean shale (2838 feet - 2926 feet). The casing was set at 2838 feet into the shale of the test interval. This graphic is presented in the well construction schematic using the electric log as a base (see Figure 3).

Analysis of two sidewall cores for particle size distribution from the injection sand was an important factor in determining the screen size. Sidewall core plugs from 2937 feet and 2945 feet were analyzed for porosity. permeability and lithology. Silt and clay particle analysis indicated a median grain size of 0.0046 inches. Using this information. the size of the screen assembly selected was 0.006 inches. the best gauge of screen that would most closely fit the particle size of the formation for a natural completion. Porosity within the test sand ranges from 29.6 to 31.8% (neutron-density log porosity ranges from 29 to 31%). with permeabilities on the order of 900 to 1400 millidarcies (md).

In order to satisfy a further worst case condition. Du Pont. at EPA's request investigated and evaluated electric logs of representative wells located within the confines of the 10.000-year waste plume. These artificial penetrations were evaluated for continuity of shale overlying the test sand. The shale of the test interval was demonstrated to be continuous and correlatable in its areal extent across the highest point of Orange Salt Dome. In addition. this test interval was at a shallow depth which minimized the geologic overburden pressures and the forces causing shale creep into the open wellbore.

## BOREHOLE CLOSURE TESTING

### OVERVIEW

Borehole closure testing started April 21. 1991 and was completed May 4. 1991. This sequence of borehole closure testing consisted of the following general steps:

#### Step 1

With drill bit and drill string still in hole. condition 9.7 lbs/gal mud in the open borehole. See Figure 4 for a schematic diagram depicting the mud circulation in the open borehole.

#### Step 2

Pulled drill string into casing and displaced mud with 9.1 lbs/gal filtered brine near the casing shoe to clean up the well bore casing and fluids prior to running the screen. transducers. and tubing assembly. (See Figure 5).

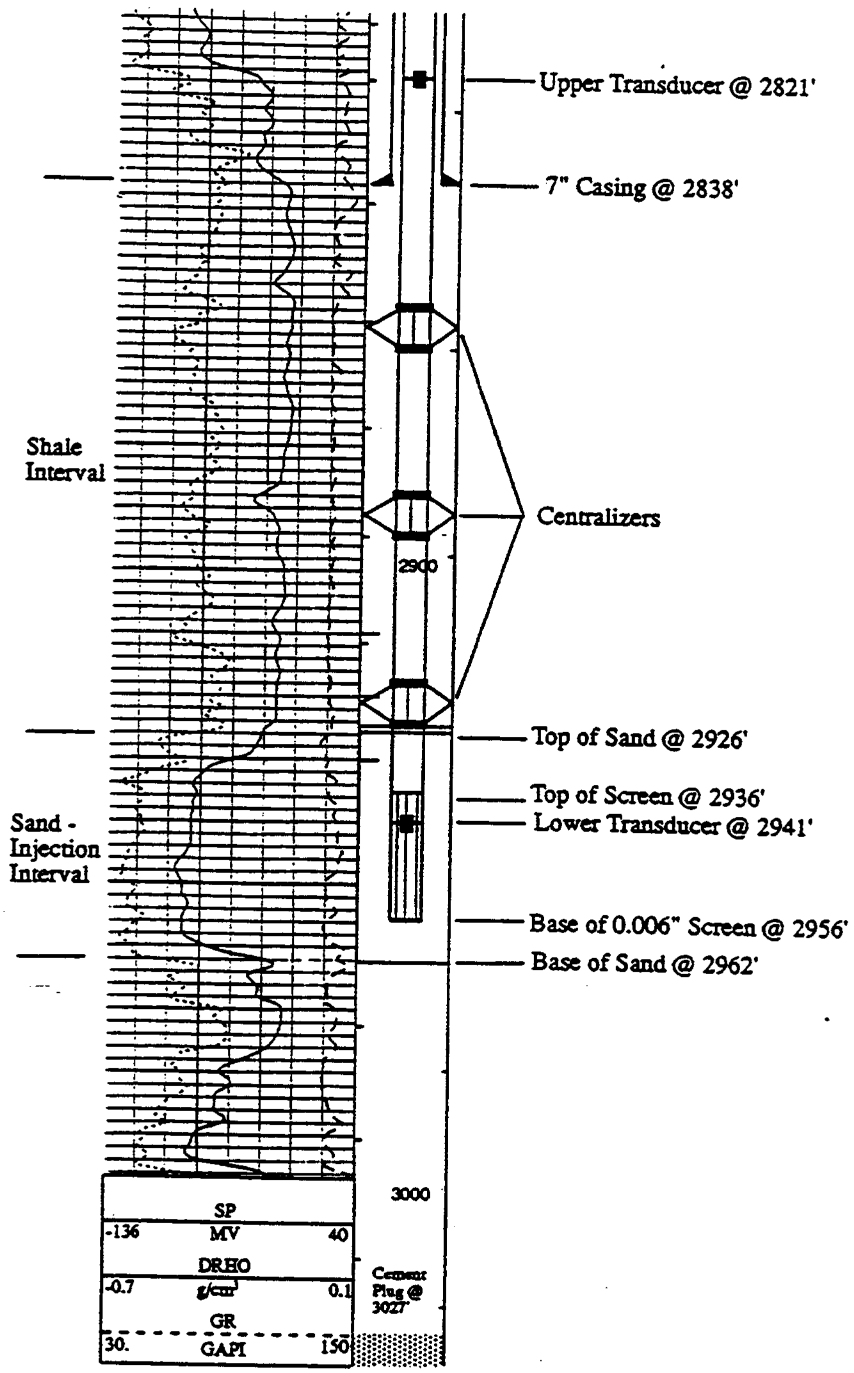


**Figure 3: Borehole Closure Test Interval**

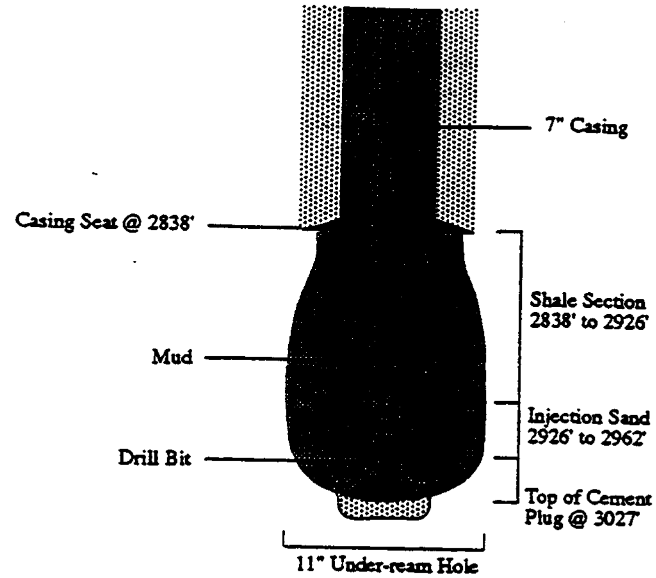


**Figure 4: Mud Circulation**

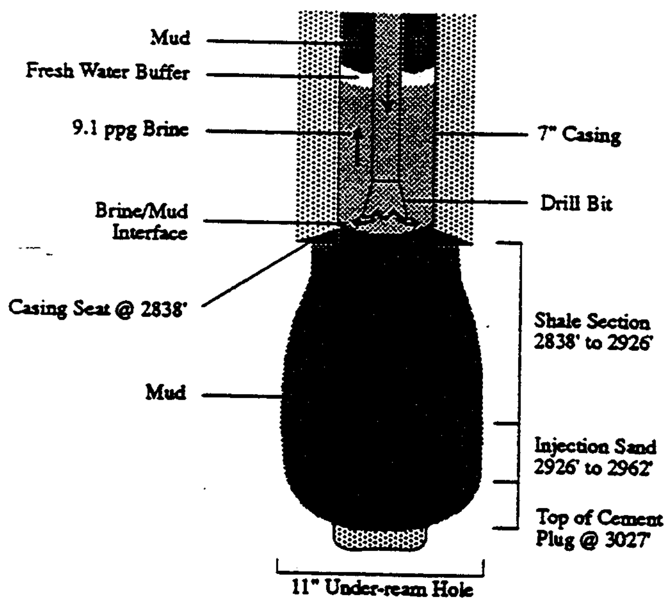


**Figure 5: Mud Displacement with Brine Near Casing Shoe**

## Step 3

After the well bore casing was displaced with 9.1 lbs/gal filtered brine. the screen assembly. transducers, and tubing were placed near the bottom of the casing shoe. A transducer test was conducted to ensure that the electrical equipment was operating properly before running the screen assembly in the open borehole. In addition. filtered brine was pumped at various flow rates up to a maximum of 8.5 barrels per minute (bbl/min) to determine the friction loss in the screen section next to the lower transducer. See Figure 6, Transducer Test at Bottom of Casing.

## Step 4

After the completion of the transducer test, the screen assembly was placed through the injection sand from 2936 feet to 2956 feet. Once this was completed. displacement of the remaining 9.7 lbs/gal mud with 9.1 lbs/gal filtered brine in the open borehole began immediately. See Figure 7. Screen Placement.

## Step 5

A total of 401 barrels of 9.1 lbs/gal filtered brine was circulated to clean up the well bore. Mud returns from the open well bore occurred on the surface after pumping 85 barrels of brine down the injection tubing. The well bore discharge line started to clean up after 200 barrels of brine were pumped into the injection tubing. An additional 200 barrels of brine were pumped at decreasing flow rates until the discharge line indicated clean fluids in the return. See Figure 8. Brine Circulation After Mud Displacement.

## Step 6

After displacement of the mud from the well bore with the 401 barrels of brine. the well was shut-in. See Figure 9. showing well shut-in with brine and recording falloff pressures.

## Step 7

After waiting one week, during which time the formation pressure achieved equilibrium. a pre-injection slug test was conducted. The pre-injection slug test verified that the screen was open and that the injection formation was responding properly. Next, a Halliburton pump truck was placed on location along with a control valve to regulate the low flow rates anticipated for the pressure build-up testing. The initial injection testing indicated that borehole closure had occurred and Schlumberger was called out to run their Water Flow Log. Schlumberger performed the logging runs at various pressure rates and depths which indicated that there was no upward channeling of fluid and that borehole closure had indeed occurred. See Figure 10 for a schematic depicting Water Flow Log and Pressure Testing with Brine Injection.

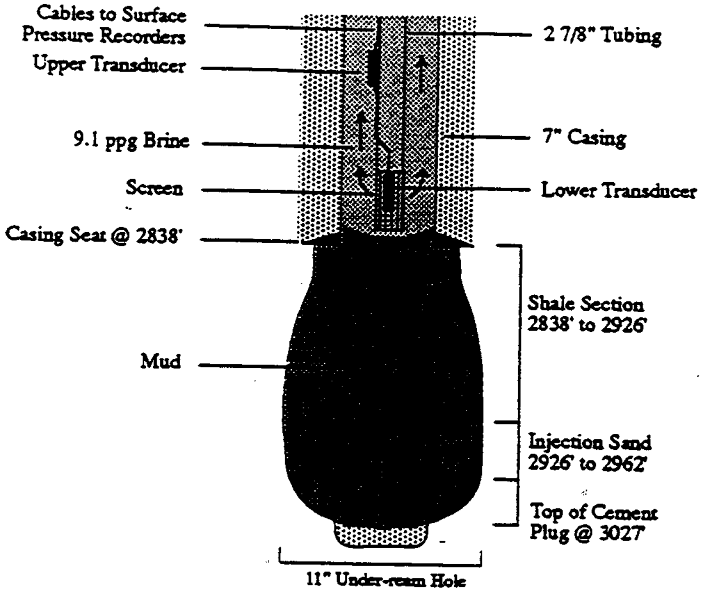


**Figure 6: Transducer Test at Bottom of Casing**

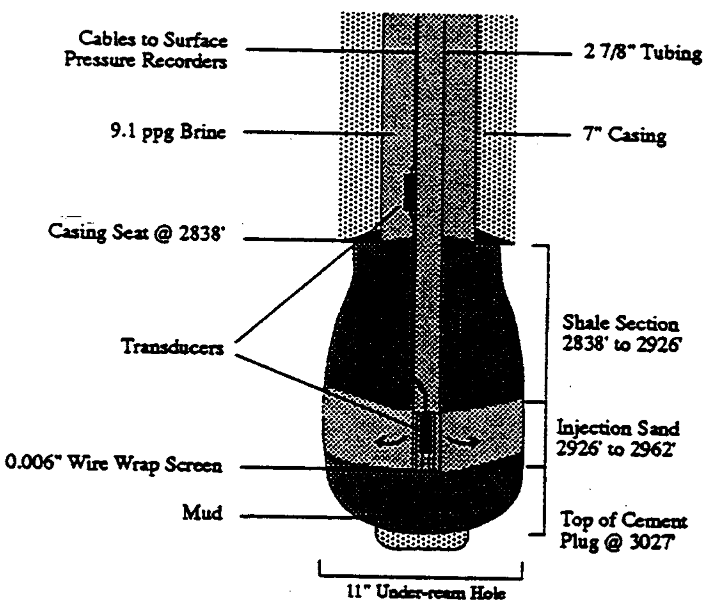


**Figure 7: Screen Placement**

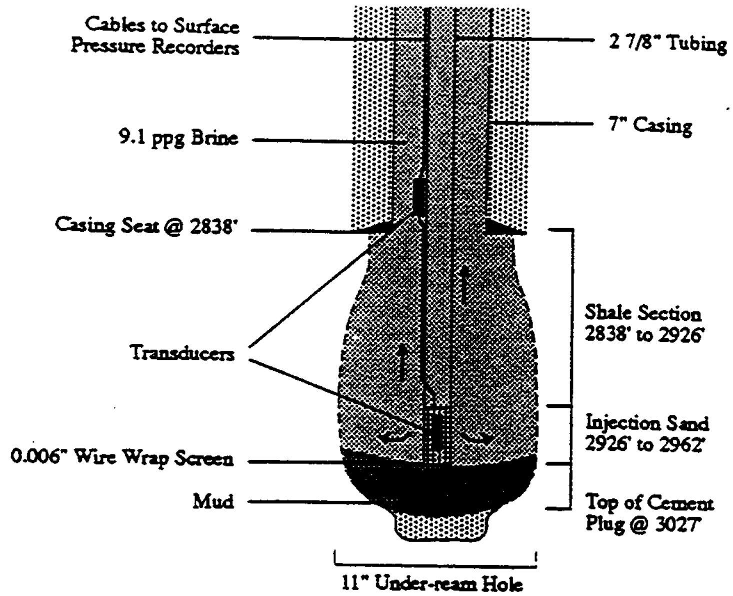


**Figure 8: Brine Circulation After Mud Displacement**

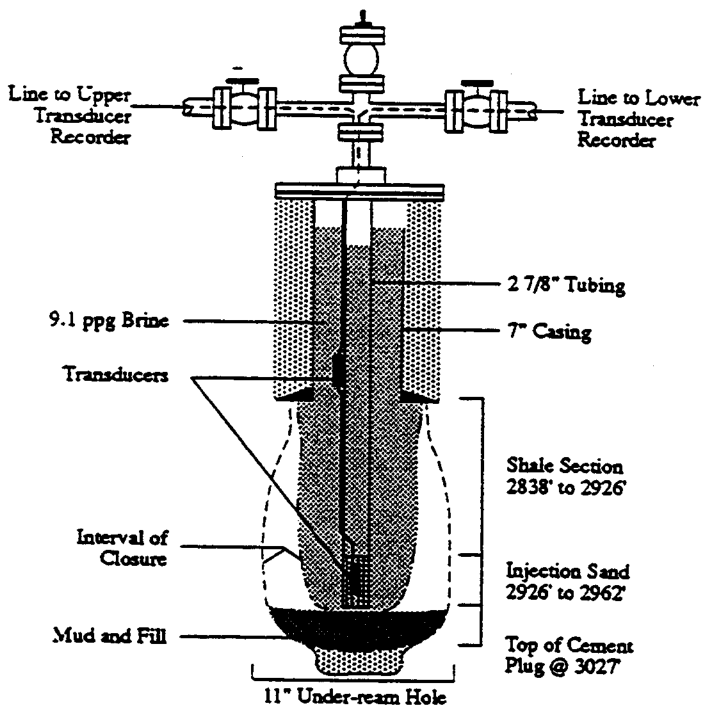


**Figure 9: Shut Well In and Record Pressures**

## DETAILS FROM CONDITIONING HOLE TO MUD DISPLACEMENT

After the open borehole was conditioned with 9.7 lbs/gal mud the drill bit and pipe were tripped out of the open borehole and placed inside the casing above the casing shoe. Drilling mud inside the casing was displaced with 9.1 lbs/gal filtered brine near the casing shoe to limit mud invasion of the well screen. Once the mud was displaced from the casing and clear brine returns appeared on the surface, brine injection stopped, and the drill bit and pipe were tripped out of the casing. The lower transducer was installed inside the well screen, approximately four feet from the top of the screen openings. An upper transducer was attached to the outside of the 2 7/8 inch tubing approximately 120 feet above the lower transducer. Next, the screen, lower and upper pressure transducers, and the tubing assembly were lowered inside the well bore to a depth near the casing shoe.

A transducer test was conducted April 23, 1991, inside the well casing prior to running the screen assembly inside the open borehole. This tested both transducers under static and dynamic conditions and ensured that all electrical equipment (transducers) was functioning properly. The lower transducer at 2758 feet had a static pressure reading of 1305 psi (see Figure 11). Therefore, the pressure transducer was operating correctly by measuring the hydrostatic pressure of the 9.1 lbs/gal brine (0.052 x 2758 ft x 9.1 lbs/gal = 1305 psi). The upper transducer at 2638 feet (see Figure 12 also was operating properly by recording the static pressure of 1248 psi (0.052 x 2638 ft x 9.1 lbs/gal = 1248 psi). Another method verifying that the transducers were recording accurately is to state that (1305 psi - 1248 psi)/(0.052 x 9.1) = 120 feet, the distance that the transducers are separated.

A dynamic test was conducted after obtaining the static pressure measurements from the lower and upper transducers (see Figures 11 and 12). This test was conducted at several production rates (1.5 to 8.5 bbl/min) per EPA Region 6 requests to determine the pressure drop or friction loss across the screen assembly. The screen assembly consists of a wire-wrapped (0.006 inch) re-inforced tubing with a total of 120 holes per foot of screen (3/8 inch diameter per hole). This type of construction minimizes friction losses in the screen assembly. The dynamic test conducted near the casing shoe revealed that the pressure loss would be less than 12 psi for 2 bbl/min flow rate in the screen assembly. The upper transducer reflected a 10 psi buildup for this same time period showing that the 12 psi loss is not all attributed to friction loss inside the screen. The injection test itself was conducted at less than 0.5 bbl/min.

## DETAILS FROM MUD DISPLACEMENT TO END OF TESTING

The pressures recorded from mud displacement to the end of testing for the lower and upper transducers are presented in Figures 13 and 14, respectively. Once the screen was properly placed, the 9.7 lbs/gal mud in the open borehole was displaced immediately with 9.1 lbs/gal filtered brine. Details for each of the major historical sequences comprising the borehole closure demonstration are described below.

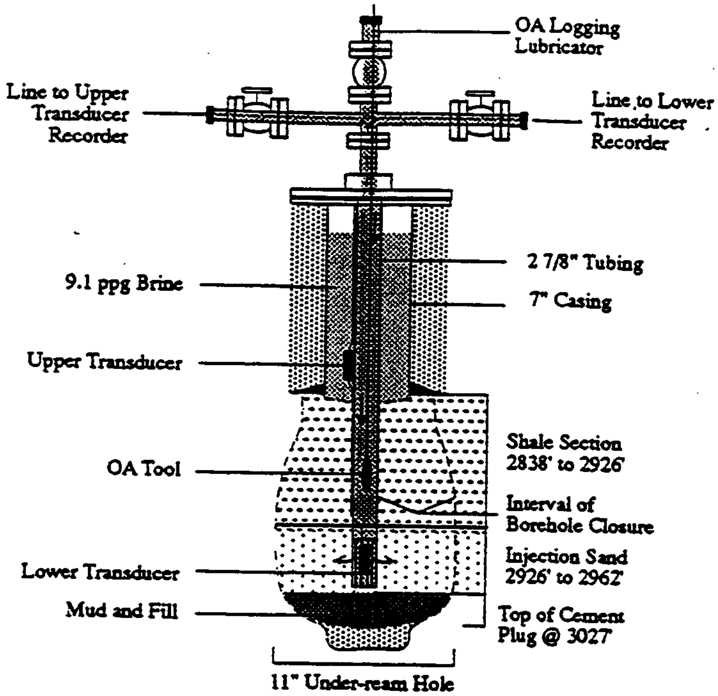


**Figure 10: Water Flow Log and Pressure Testing with Brine Injection**

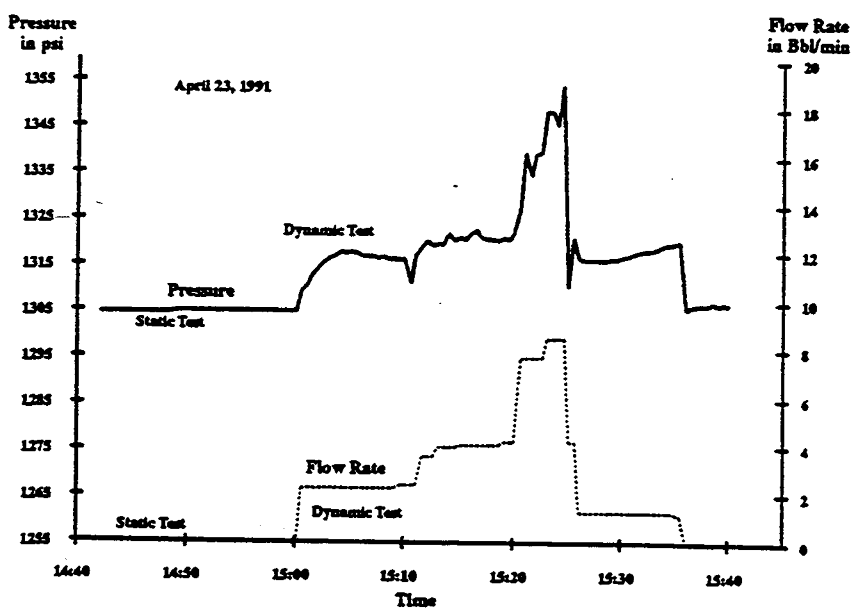


**Figure 11: Transducer Test Near Casing Shoe With Lower Transducer at 2758 feet**

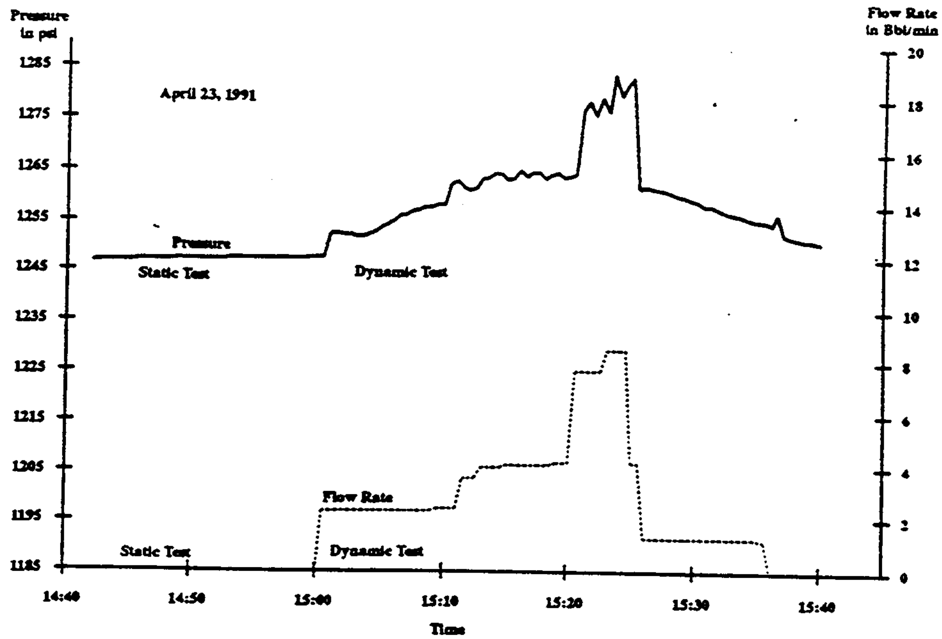


**Figure 12: Transducer Test Near Casing Shoe With Upper Transducer at 2638 feet**

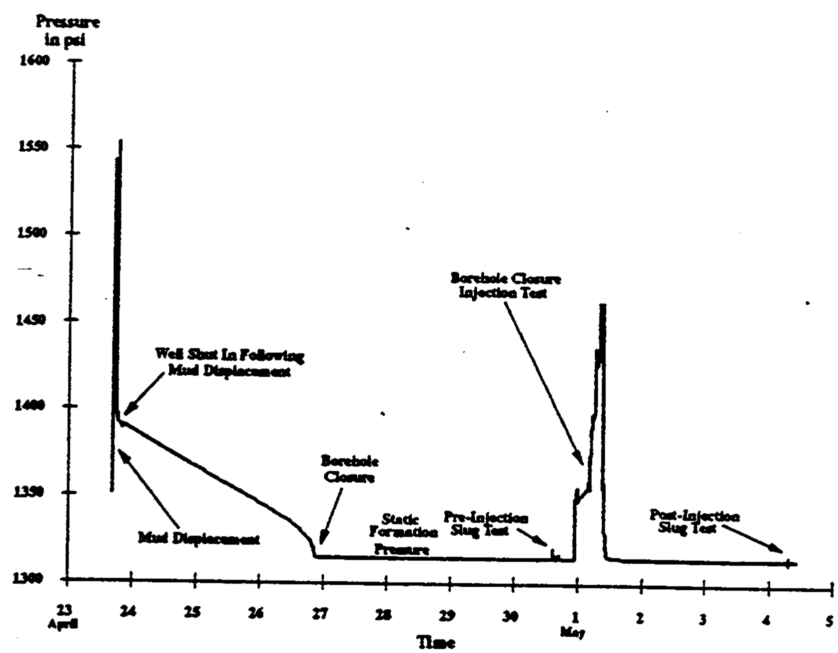


**Figure 13: Lower Transducer Data From Mud Displacement to End of Testing**

A total of 401 bbl of 9.1 lbs/gal filtered brine was pumped through the injection tubing with returns to the surface. Figure 15 shows that the mud displacement caused an increase in the pressure of the upper transducer at 2821 feet until mud was displaced from the well bore. After pumping 85 bbl of brine the drilling mud appeared on the surface and the discharge line was switched from the brine tank to the mud tank. The discharge rate near the end of the test was reduced gradually to prevent sudden well surges which could cause the well screen to fill with sand.

The final brine returns were clean with only minute traces of gumbo shale. After the mud displacement sequence, the well bore was shut-in and pressures were recorded. Recovery data (see Figure 16) show a slow pressure decline. Pressure data indicate that borehole closure occurred within 3 to 4 days after the well was shut-in following mud displacement. The screened interval or lower transducer reflects static formation pressure (1314 psi) within this time frame. Also, the upper transducer (inside the well casing) indicates a pressure-time slope change within this same time period. Only minor pressure changes occurred after this time period for the upper transducer, and this would be expected because the brine could still react with the shale below the casing shoe. Calculation of different fluid levels from the upper and lower transducers also show isolation of the two zones.

According to procedures agreed upon by Du Pont and EPA Region 6, it was Du Pont's decision to determine what duration to leave the well bore shut-in. Du Pont notifed EPA Region 6 after placement of the screen assembly that it would leave the well in a static condition for a time period of approximately one week before starting the injection test.

A pre-injection slug test (see Figure 17) consisting of two separate series of five slugs (each slug equaled 2.5 gallons of brine) was performed April 30, 1991, one week after shut in. The purpose of this test was threefold: 1) to determine if the screen was open and operating properly, 2) to determine the volume of water that might be needed to conduct a pressure buildup in the formation, and 3) to determine if there was a pressure response in the upper transducer. As shown in Figure 17, the fall-off curves in the lower transducer indicated that the screen was open (i.e., not filled with sand). There was no pressure response in the upper transducer from the slug testing, indicating that the two transducers were indeed isolated. Finally, the testing revealed that a pump truck would be required to control the low flow rate of brine injection. In addition, because the required flow rates could be lower than a truck could pump (less than 20 gpm), a valve was installed to regulate even lower flow rates. Halliburton computer flow monitoring and pumping services, Otis filters and brine fluids were ordered to the location for the borehole closure injection test.

Early testing data showed that the lower transducer was recording pressure buildup with no pressure increase observed in the upper transducer. The flow rate was increased slightly from 16 gpm to 22 gpm to obtain a 40 psi buildup. At this point, before reaching 50 psi of formation buildup, Schlumberger was called to run a Water Flow Log which would check for upward fluid channeling. Schlumberger was contacted for logging services at 23:30 hours on April 30, 1991. In order to conserve brine the flow rate was reduced to 16 gpm. The upper transducer continued to show no pressure change from injection, except for minor temperature anomalies associated

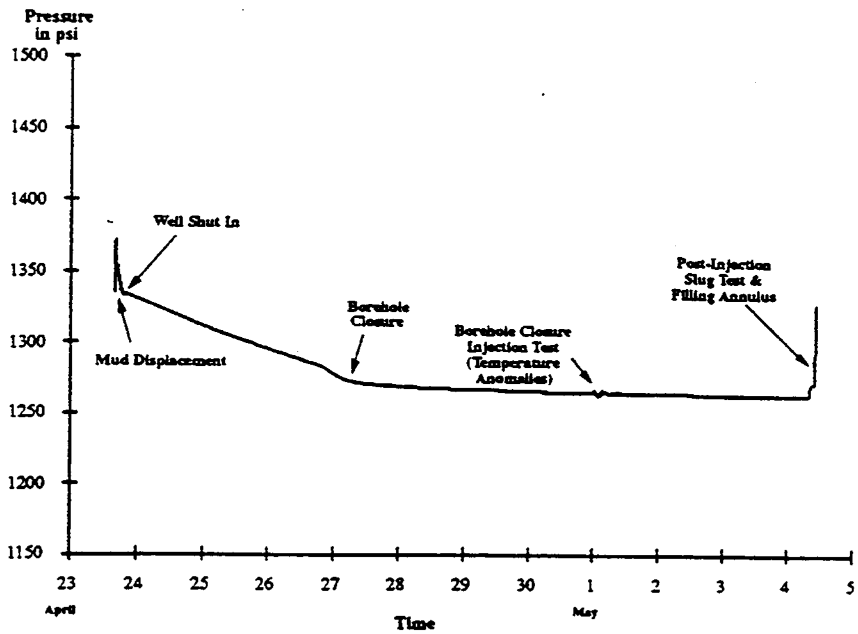


**Figure 14: Upper Transducer Data from Mud Displacement to End of Testing**

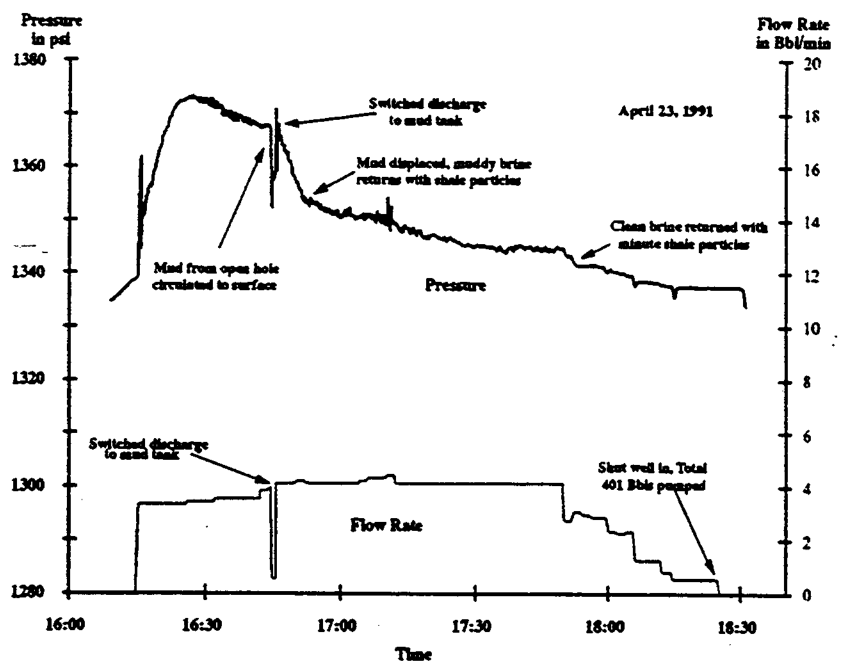


**Figure 15: Mud Displacement With Upper Transducer at 2821 feet**

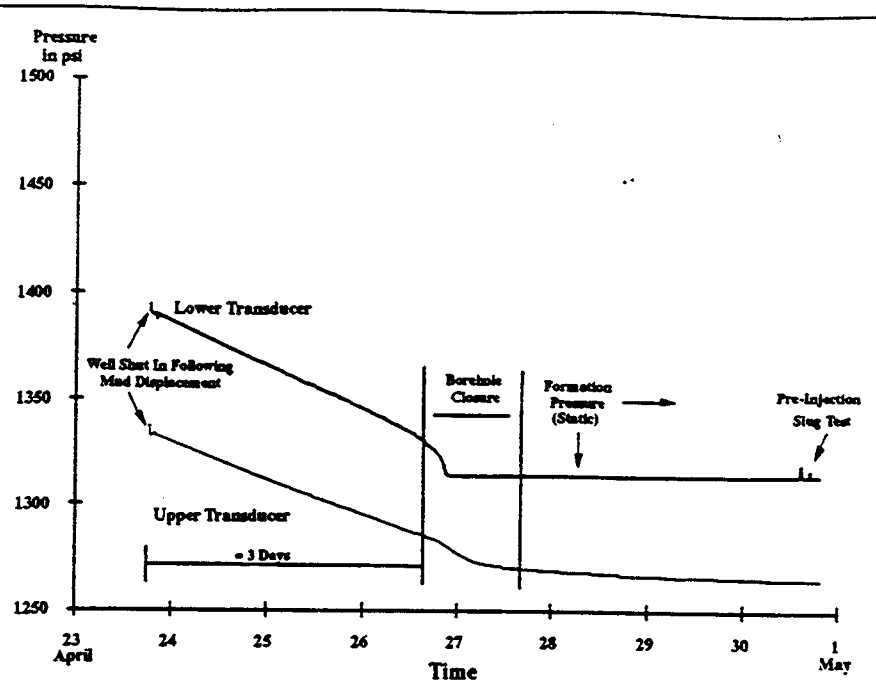


**Figure 16: Recovery Following Mud Displacement**

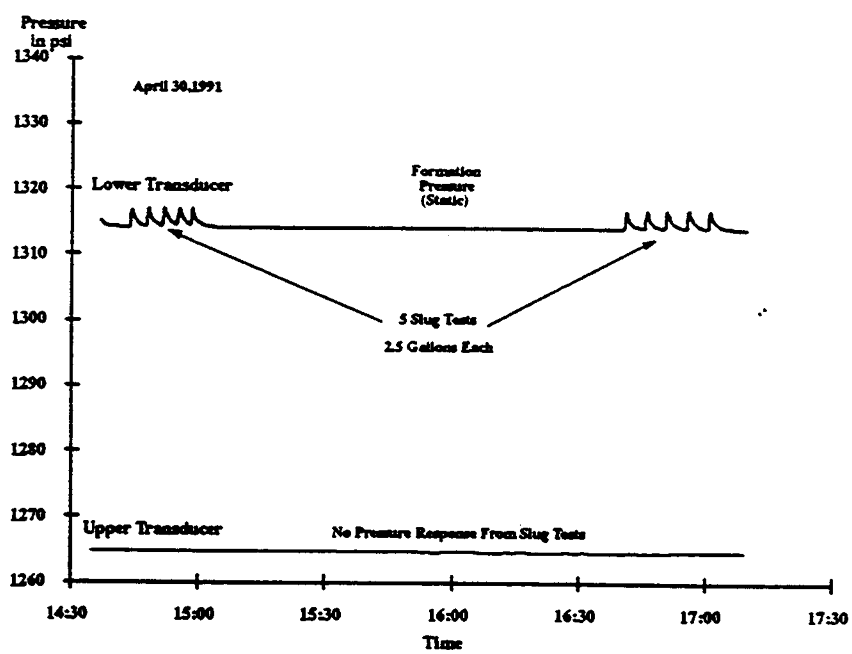


**Figure 17: Pre-Injection Slug Test**

with the cooling effect of injection fluids. Figure 18 presents an overview of the borehole closure injection test for the upper and lower transducer and a plot of fluid temperature. Figure 19 is an enlargement of fluid injection temperatures and the upper transducer pressures. This graph demonstrates the minute temperature anomalies associated with the cooling of fluids in the well bore.

Figure 20 is a plot of transducer pressure and flow rates during the borehole closure testing. The Water Flow Log was conducted within the tubing under pressure control conditions at 90 psi, 110 psi, and 140 psi above static formation pressure and at stations within the overlying shale interval at approximately 25 feet, 50 feet, and 75 feet above the test injection sand. In an attempt to maintain constant formation pressure during each OA log run, the flow rates were reduced. Flow rates were increased to obtain the next formation pressure OA log run; however, the formation pressures continued to increase and the flow rates were further reduced (see Figure 20) to maintain a consistent formation pressure increase over static. Both the upper transducer and the OA logging indicate no upward channeling of fluid. The final run of the Water Flow Log (OA) showed no upward movement of fluids even as shallow as 25 feet above the injection sand.

Du Pont conducted a post-injection test prior to cutting the transducer lines to the surface recorders and pulling the tubing and screen assembly. The purpose of this test was to verify that the lower transducer was still working and that the upper transducer would respond to fluid placed in the annulus. Figure 21 shows that the upper transducer was working and that there was no bleed-off of pressure into the lower transducer. This was the case even when the annulus was filled to the surface with fluid. This also demonstrated well closure and sealing of the shale section between the injection sand and the casing. Table 1 shows x-ray diffraction data for the test interval and indicates that the shale section consists of expandable smectite clay layers.

EPA was not only interested in whether natural borehole closure occurred, but also if a rate of borehole closure could be quantified. During this test, natural borehole closure was demonstrated, and a rate of borehole closure was 'quantified'.

## CONCLUSION

The borehole closure test was designed and constructed according to EPA criteria for a worst-case scenario. This worst-case scenario assumes that hazardous waste migrates across a non-sealing fault and encounters an artificial penetration of maximum borehole diameter filled with 9.0 lb/gal brine. The test interval selected was a thin sand overlain by a thick, sand-free shale.

The test sand was pressured up to the pressure specified and greater with no upward fluid flow or channeling detected during oxygen activation logging station, even with a minimum of 25 feet of shale. Recorded pressures indicate no channeling of fluid because of the pressure differential between the two sensors. Results of the test provide conclusive evidence that a borehole closes naturally, even under a worst-case scenario.

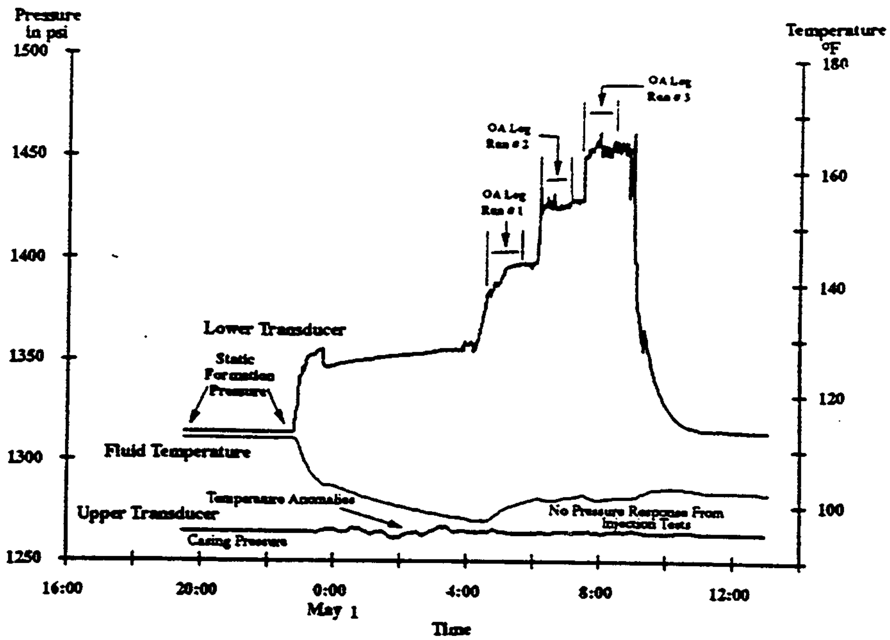


**Figure 18: Borehole Closure Injection Test Upper and Lower Transducers- Pressure & Temperature**

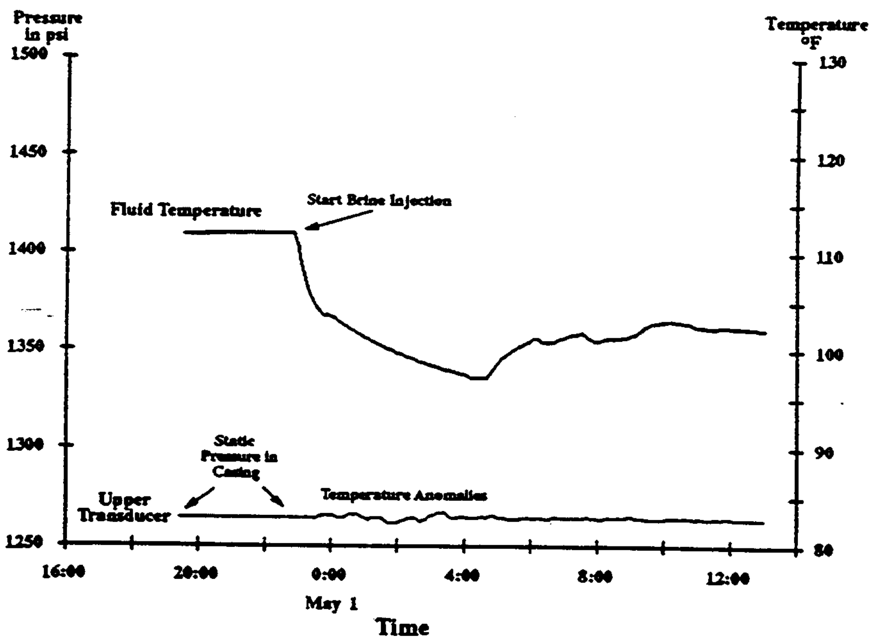


**Figure 19: Borehole Closure Injection Test-Fluid Temperature Anomalies**

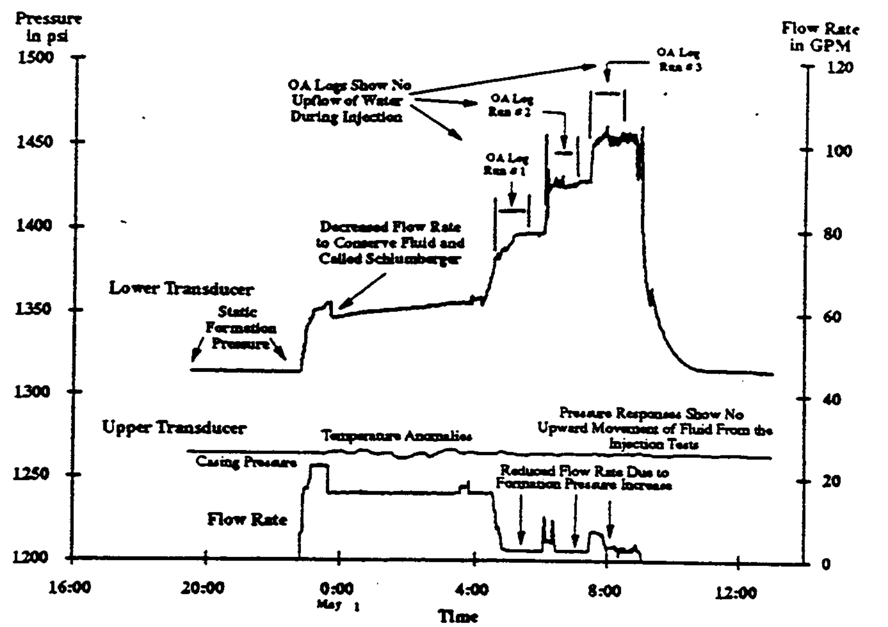


**Figure 20: Borehole Closure Injection Test-Upper and Lower Transducer Pressure and Flow Rate**

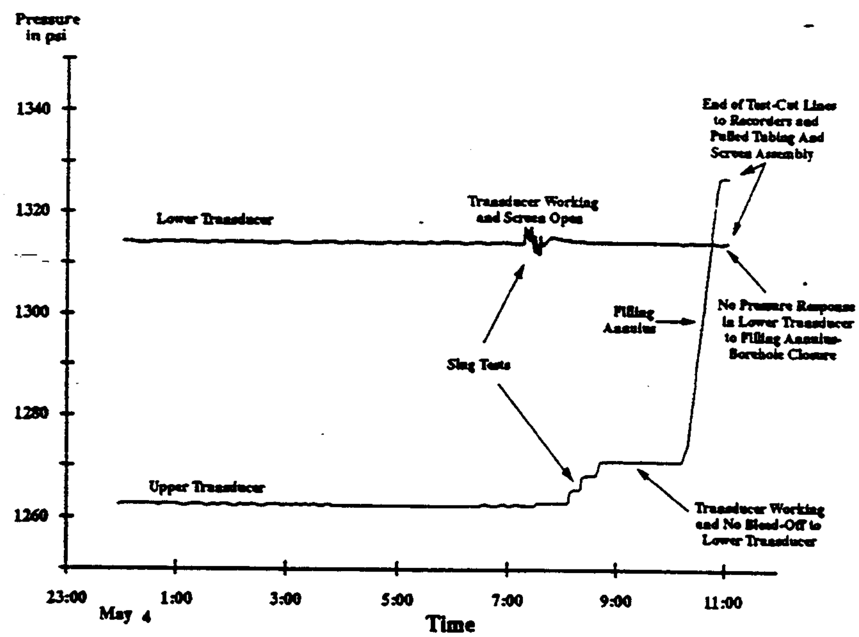


**Figure 21: Post-Injection Transducer Testing**

# Table I

## Du Pont Borehole Closure
## Orange Petroleum No. 35 Hager

X-RAY DIFFRACTION (XRD) DATA
(Weight Percent)

| Depth: | 2737 | 2900 | 2925 | 2940 | 3110 |
|---|---|---|---|---|---|
| | | | BULK MINERALOGY (Calculated)* | | |
| Quartz | 25 | 41 | 30 | 77 | 23 |
| Total Feldspar | 02 | 06 | 04 | 15 | 04 |
| Plagioclase | 01 | 03 | 02 | 06 | 02 |
| K-Feldspar | 01 | 03 | 02 | 09 | 02 |
| Calcite | 02 | 08 | 20 | 02 | 14 |
| Dolomite | — | — | 01 | — | trace |
| Fe-Dolomite | — | trace | — | trace | — |
| Siderite | — | — | — | trace | — |
| Pyrite | 04 | 01 | 08 | — | trace |
| Total Clay | 67 | 44 | 37 | 06 | 59 |
| | 100% | 100% | 100% | 100% | 100% |
| | | | Relative Clay Abundance (Normalized to 100%) | | |
| Kaolinite | 05 | 05 | 09 | 08 | 05 |
| Chlorite | 02 | 02 | 02 | 02 | 03 |
| Illite | 05 | 06 | 08 | 04 | 08 |
| Mixed-Layer Illite/Smectite** | 88(80) | 87(85) | 81(85) | 86(85) | 84(75) |
| | 100% | 100% | 100% | 100% | 100% |

* Bulk mineralogy is calculated from sand/silt-size and clay-size XRD data.
** Numbers in ( ) are percent expandable smectite interlayers in mixed layer clays.

## ACKNOWLEDGMENTS

We acknowledge Joe Kordzi and Ronnie Crossland, EPA, who critiqued the test procedures and submitted recommendations which were incorporated into the borehole closure protocol. We thank Marion Miller for providing drilling engineering services at the borehole closure well.

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## BIOGRAPHICAL SKETCHES

**James E. Clark** holds a B.S. in geology (1972) from Auburn University and an M.S. in geophysical sciences (1977) from Georgia Institute of Technology. As a geohydrologist with Law Engineering Testing Co., he worked on suitability studies of salt domes as repositories for nuclear waste. He is a consultant with Du Pont's (E. I. du Pont de Nemours & Co., Inc., Engineering Department, P. O. Box 3269, Beaumont, TX 77704) solid waste and geological engineering group and is active in permitting and evaluation of disposal wells.

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APPENDIX 4

Listing of unstudied counties in Texas Gulf Coast Frio Formation producing trend with fields that have five or more active TRRC UIC database wells.

Texas Railroad Commission
Underground Injection Control Database

Legend of Well Types
- Type 1 -- Disposal Well (Non-Producing Zone)
- Type 2 -- Disposal Well (Producing Zone)
- Type 3 -- Secondary Recovery Injection Well
- Type 4 -- Liquid Hydrocarbon Storage Well
- Type 5 -- Gas Storage Well
- Type 6 -- Other Injection Wells

| | | -------------- | -----Well | Type----- | ------------ | | | No. |
|---|---|---|---|---|---|---|---|---|
| ounty | # | 1 | 2 | 3 | 4 | 5 | 6 | Total | Plug |
| ARANSAS | 7 | 13 | 1 | 4 | 0 | 0 | 0 | 18 | 3 |
| BEE | 25 | 92 | 14 | 6 | 0 | 0 | 0 | 112 | 33 |
| BROOKS | 47 | 31 | 13 | 49 | 0 | 0 | 0 | 93 | 45 |
| CALHOUN | 57 | 38 | 11 | 5 | 0 | 0 | 0 | 54 | 18 |
| FORT BEND | 157 | 164 | 26 | 45 | 0 | 3 | 8 | 246 | 85 |
| GALVESTON | 167 | 93 | 14 | 17 | 0 | 0 | 0 | 124 | 45 |
| GOLIAD | 175 | 48 | 10 | 14 | 0 | 0 | 0 | 72 | 28 |
| HARRIS | 201 | 227 | 64 | 90 | 0 | 20 | 29 | 430 | 143 |
| HIDALGO | 215 | 85 | 13 | 7 | 0 | 0 | 0 | 105 | 21 |
| JEFFERSON | 245 | 167 | 9 | 13 | 2 | 36 | 6 | 233 | 82 |
| JIM WELLS | 249 | 76 | 19 | 122 | 0 | 0 | 0 | 217 | 113 |
| KENEDY | 261 | 29 | 6 | 22 | 0 | 0 | 0 | 57 | 13 |
| KLEBERG | 273 | 63 | 19 | 115 | 0 | 0 | 0 | 197 | 132 |
| MATAGORDA | 321 | 146 | 5 | 74 | 0 | 31 | 2 | 258 | 116 |
| ORANGE | 361 | 21 | 6 | 28 | 0 | 0 | 0 | 55 | 4 |
| WHARTON | 481 | 183 | 75 | 32 | 37 | 0 | 4 | 331 | 88 |
| WILLACY | 489 | 32 | 13 | 104 | 0 | 0 | 2 | 151 | 28 |
| 7 Counties | | 1508 | 318 | 747 | 39 | 90 | 2 | 2753 | 997 |

Texas Railroad Commission
Underground Injection Control Database
For Fields With 5 or More Active Wells of (Type 1 + 2 + 3)

Legend of Well Types
Type 1 -- Disposal Well (Non-Producing Zone)
Type 2 -- Disposal Well (Producing Zone)
Type 3 -- Secondary Recovery Injection Well
Type 4 -- Liquid Hydrocarbon Storage Well
Type 5 -- Gas Storage Well
Type 6 -- Other Injection Wells

County : ARANSAS RRC # 7

| Field (Reservoir) | RRC # | Well Type 1 | 2 | 3 | 4 | 5 | 6 | Total | No. Plug |
|---|---|---|---|---|---|---|---|---|---|
| 0 Fields (Reservoirs) | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Texas Railroad Commission
Underground Injection Control Database
For Fields With 5 or More Active Wells of (Type 1 + 2 + 3)

Legend of Well Types
Type 1 -- Disposal Well (Non-Producing Zone)
Type 2 -- Disposal Well (Producing Zone)
Type 3 -- Secondary Recovery Injection Well
Type 4 -- Liquid Hydrocarbon Storage Well
Type 5 -- Gas Storage Well
Type 6 -- Other Injection Wells

County : BEE RRC # 25

| Field (Reservoir) | RRC # | Well Type 1 | 2 | 3 | 4 | 5 | 6 | Total | No. Plug |
|---|---|---|---|---|---|---|---|---|---|
| YOUGEEN | 99446 | 6 | 0 | 0 | 0 | 0 | 0 | 6 | 0 |
| PAPALOTE E. (3250) | 69044 | 10 | 0 | 1 | 0 | 0 | 0 | 11 | 1 |
| PAPALOTE E. (3250 -B-) | 69044 | 11 | 0 | 0 | 0 | 0 | 0 | 11 | 1 |
| 3 Fields (Reservoirs) | | 27 | 0 | 1 | 0 | 0 | 0 | 28 | 2 |

Texas Railroad Commission
Underground Injection Control Database
For Fields With 5 or More Active Wells of (Type 1 + 2 + 3)

Legend of Well Types
Type 1 -- Disposal Well (Non-Producing Zone)
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Type 3 -- Secondary Recovery Injection Well
Type 4 -- Liquid Hydrocarbon Storage Well
Type 5 -- Gas Storage Well
Type 6 -- Other Injection Wells

County : BROOKS RRC # 47

| Field (Reservoir) | RRC # | Well Type 1 | 2 | 3 | 4 | 5 | 6 | Total | No. Plug |
|---|---|---|---|---|---|---|---|---|---|
| 0 Fields (Reservoirs) | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Texas Railroad Commission
Underground Injection Control Database
For Fields With 5 or More Active Wells of (Type 1 + 2 + 3)

Legend of Well Types
Type 1 -- Disposal Well (Non-Producing Zone)
Type 2 -- Disposal Well (Producing Zone)
Type 3 -- Secondary Recovery Injection Well
Type 4 -- Liquid Hydrocarbon Storage Well
Type 5 -- Gas Storage Well
Type 6 -- Other Injection Wells

County : CALHOUN RRC # 57

| Field (Reservoir) | RRC # | Well Type 1 | 2 | 3 | 4 | 5 | 6 | Total | No. Plug |
|---|---|---|---|---|---|---|---|---|---|
| HEYSER | 40957 | 8 | 1 | 1 | 0 | 0 | 0 | 10 | 3 |
| HEYSER (5400 #2) | 40957 | 6 | 3 | 6 | 0 | 0 | 0 | 15 | 3 |
| HEYSER (5400 #3) | 40957 | 5 | 1 | 3 | 0 | 0 | 0 | 9 | 2 |
| 3 Fields (Reservoirs) | | 19 | 5 | 10 | 0 | 0 | 0 | 34 | 8 |

Texas Railroad Commission
Underground Injection Control Database
For Fields With 5 or More Active Wells of (Type 1 + 2 + 3)

Legend of Well Types
- Type 1 -- Disposal Well (Non-Producing Zone)
- Type 2 -- Disposal Well (Producing Zone)
- Type 3 -- Secondary Recovery Injection Well
- Type 4 -- Liquid Hydrocarbon Storage Well
- Type 5 -- Gas Storage Well
- Type 6 -- Other Injection Wells

County : FORT BEND RRC # 157

| Field (Reservoir) | RRC # | Well Type 1 | 2 | 3 | 4 | 5 | 6 | Total | No. Plug |
|---|---|---|---|---|---|---|---|---|---|
| KATY (I-B) | 48278 | 10 | 0 | 2 | 0 | 0 | 0 | 12 | 3 |
| THOMPSON | 89525 | 77 | 7 | 11 | 0 | 0 | 0 | 95 | 30 |
| THOMPSON SOUTH | 89530 | 18 | 3 | 0 | 0 | 0 | 0 | 21 | 9 |
| BIG CREEK | 7808 | 10 | 2 | 1 | 0 | 0 | 0 | 13 | 3 |
| BOLING | 10229 | 15 | 5 | 1 | 0 | 0 | 4 | 25 | 9 |
| NASH DOME | 64535 | 8 | 0 | 3 | 0 | 0 | 0 | 11 | 4 |
| SUGARLAND | 86980 | 3 | 3 | 2 | 0 | 0 | 0 | 8 | 3 |
| THOMPSON NORTH | 89527 | 3 | 2 | 10 | 0 | 0 | 0 | 15 | 0 |
| 8 Fields (Reservoirs) | | 144 | 22 | 30 | 0 | 0 | 4 | 200 | 61 |

Texas Railroad Commission
Underground Injection Control Database
For Fields With 5 or More Active Wells of (Type 1 + 2 + 3)

Legend of Well Types
Type 1 -- Disposal Well (Non-Producing Zone)
Type 2 -- Disposal Well (Producing Zone)
Type 3 -- Secondary Recovery Injection Well
Type 4 -- Liquid Hydrocarbon Storage Well
Type 5 -- Gas Storage Well
Type 6 -- Other Injection Wells

County : GALVESTON RRC # 167

| Field (Reservoir) | RRC # | Well Type 1 | 2 | 3 | 4 | 5 | 6 | Total | No. Plug |
|---|---|---|---|---|---|---|---|---|---|
| GILLOCK SOUTH | 34929 | 9 | 8 | 2 | 0 | 0 | 0 | 19 | 9 |
| HITCHCOCK NE. (FRIO 9100) | 41677 | 8 | 0 | 0 | 0 | 0 | 0 | 8 | 0 |
| HIGH ISLAND | 41139 | 3 | 5 | 5 | 0 | 0 | 0 | 13 | 3 |
| HASTINGS EAST | 39598 | 34 | 1 | 0 | 0 | 0 | 0 | 35 | 18 |
| 4 Fields (Reservoirs) | | 54 | 14 | 7 | 0 | 0 | 0 | 75 | 30 |

Texas Railroad Commission
Underground Injection Control Database
For Fields With 5 or More Active Wells of (Type 1 + 2 + 3)

Legend of Well Types
Type 1 -- Disposal Well (Non-Producing Zone)
Type 2 -- Disposal Well (Producing Zone)
Type 3 -- Secondary Recovery Injection Well
Type 4 -- Liquid Hydrocarbon Storage Well
Type 5 -- Gas Storage Well
Type 6 -- Other Injection Wells

County : GOLIAD RRC # 175

| Field (Reservoir) | RRC # | Well Type 1 | 2 | 3 | 4 | 5 | 6 | Total | No. Plug |
|---|---|---|---|---|---|---|---|---|---|
| LIVE OAK LAKE (5000) | 54144 | 5 | 0 | 0 | 0 | 0 | 0 | 5 | 0 |
| 1 Fields (Reservoirs) | | 5 | 0 | 0 | 0 | 0 | 0 | 5 | 0 |

Texas Railroad Commission
Underground Injection Control Database
For Fields With 5 or More Active Wells of (Type 1 + 2 + 3)

Legend of Well Types
Type 1 -- Disposal Well (Non-Producing Zone)
Type 2 -- Disposal Well (Producing Zone)
Type 3 -- Secondary Recovery Injection Well
Type 4 -- Liquid Hydrocarbon Storage Well
Type 5 -- Gas Storage Well
Type 6 -- Other Injection Wells

County : HARRIS RRC # 201

| Field (Reservoir) | RRC # | --------------Well Type------------ 1 | 2 | 3 | 4 | 5 | 6 | Total | No. Plug |
|---|---|---|---|---|---|---|---|---|---|
| TOMBALL | 90620 | 17 | 14 | 0 | 0 | 0 | 0 | 31 | 8 |
| PIERCE JUNCTION | 71444 | 22 | 11 | 1 | 0 | 19 | 0 | 53 | 23 |
| WEBSTER | 95731 | 36 | 7 | 48 | 0 | 0 | 0 | 91 | 26 |
| DYERSDALE N. (Y-5) | 26878 | 5 | 0 | 0 | 0 | 0 | 0 | 5 | 0 |
| CLEAR LAKE | 18847 | 10 | 0 | 0 | 0 | 0 | 0 | 10 | 5 |
| GOOSE CREEK | 35862 | 15 | 9 | 9 | 0 | 0 | 0 | 33 | 10 |
| HUMBLE | 43464 | 27 | 8 | 4 | 0 | 0 | 0 | 39 | 16 |
| RANKIN | 74691 | 1 | 1 | 7 | 0 | 0 | 0 | 9 | 3 |
| KATY (I-B) | 48278 | 10 | 0 | 2 | 0 | 0 | 0 | 12 | 3 |
| ROTHERWOOD W. (COCKFIELD | -78482 | 0 | 2 | 8 | 0 | 0 | 0 | 10 | 0 |
| HULL | 43381 | 42 | 5 | 6 | 0 | 12 | 0 | 65 | 18 |
| 11 Fields (Reservoirs) | | 185 | 57 | 85 | 0 | 31 | 0 | 358 | 112 |

Texas Railroad Commission
Underground Injection Control Database
For Fields With 5 or More Active Wells of (Type 1 + 2 + 3)

Legend of Well Types
Type 1 -- Disposal Well (Non-Producing Zone)
Type 2 -- Disposal Well (Producing Zone)
Type 3 -- Secondary Recovery Injection Well
Type 4 -- Liquid Hydrocarbon Storage Well
Type 5 -- Gas Storage Well
Type 6 -- Other Injection Wells

County : HIDALGO RRC # 215

| Field (Reservoir) | RRC # | Well Type 1 | 2 | 3 | 4 | 5 | 6 | Total | No. Plug |
|---|---|---|---|---|---|---|---|---|---|
| 0 Fields (Reservoirs) | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Texas Railroad Commission
Underground Injection Control Database
For Fields With 5 or More Active Wells of (Type 1 + 2 + 3)

Legend of Well Types
Type 1 -- Disposal Well (Non-Producing Zone)
Type 2 -- Disposal Well (Producing Zone)
Type 3 -- Secondary Recovery Injection Well
Type 4 -- Liquid Hydrocarbon Storage Well
Type 5 -- Gas Storage Well
Type 6 -- Other Injection Wells

County : JEFFERSON RRC # 245

| Field (Reservoir) | RRC # | Well Type 1 | 2 | 3 | 4 | 5 | 6 | Total | No. Plug |
|---|---|---|---|---|---|---|---|---|---|
| STOWELL | 86429 | 13 | 0 | 0 | 0 | 0 | 0 | 13 | 6 |
| BEAUMONT WEST | 6532 | 11 | 0 | 0 | 0 | 0 | 0 | 11 | 5 |
| LOVELLS LAKE (MARG. 2) | 55184 | 11 | 0 | 4 | 0 | 0 | 0 | 15 | 7 |
| CLAM LAKE | 18458 | 6 | 0 | 0 | 0 | 0 | 0 | 6 | 1 |
| FANNETT | 30153 | 7 | 1 | 1 | 2 | 6 | 0 | 17 | 8 |
| LA BELLE | 50638 | 9 | 0 | 0 | 0 | 0 | 0 | 9 | 2 |
| SPINDLETOP | 85195 | 13 | 2 | 6 | 0 | 0 | 6 | 27 | 13 |
| BIG HILL | 7884 | 12 | 1 | 0 | 0 | 30 | 0 | 43 | 4 |
| 8 Fields (Reservoirs) | | 82 | 4 | 11 | 2 | 36 | 6 | 141 | 46 |

Texas Railroad Commission
Underground Injection Control Database
For Fields With 5 or More Active Wells of (Type 1 + 2 + 3)

Legend of Well Types
- Type 1 -- Disposal Well (Non-Producing Zone)
- Type 2 -- Disposal Well (Producing Zone)
- Type 3 -- Secondary Recovery Injection Well
- Type 4 -- Liquid Hydrocarbon Storage Well
- Type 5 -- Gas Storage Well
- Type 6 -- Other Injection Wells

County : JIM WELLS RRC # 249

| Field (Reservoir) | RRC # | Well Type 1 | 2 | 3 | 4 | 5 | 6 | Total | No. Plug |
|---|---|---|---|---|---|---|---|---|---|
| LA GLORIA (LOS OLMOS) | 50744 | 3 | 2 | 0 | 0 | 0 | 0 | 5 | 0 |
| SEELIGSON (COMBINED ZONES) | 82126 | 2 | 1 | 95 | 0 | 0 | 0 | 98 | 61 |
| TIJERINA-CANALES-BLUCHER | 89945 | 13 | 0 | 3 | 0 | 0 | 0 | 16 | 6 |
| T.-C.-B. 21 (B-1) NORTH | 89945 | 3 | 4 | 3 | 0 | 0 | 0 | 10 | 5 |
| 4 Fields (Reservoirs) | | 21 | 7 | 101 | 0 | 0 | 0 | 129 | 72 |

Texas Railroad Commission
Underground Injection Control Database
For Fields With 5 or More Active Wells of (Type 1 + 2 + 3)

Legend of Well Types
- Type 1 -- Disposal Well (Non-Producing Zone)
- Type 2 -- Disposal Well (Producing Zone)
- Type 3 -- Secondary Recovery Injection Well
- Type 4 -- Liquid Hydrocarbon Storage Well
- Type 5 -- Gas Storage Well
- Type 6 -- Other Injection Wells

County : KENEDY RRC # 261

| Field (Reservoir) | RRC # | Well Type 1 | 2 | 3 | 4 | 5 | 6 | Total | No. Plug |
|---|---|---|---|---|---|---|---|---|---|
| 0 Fields (Reservoirs) | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Texas Railroad Commission
Underground Injection Control Database
For Fields With 5 or More Active Wells of (Type 1 + 2 + 3)

Legend of Well Types
Type 1 -- Disposal Well (Non-Producing Zone)
Type 2 -- Disposal Well (Producing Zone)
Type 3 -- Secondary Recovery Injection Well
Type 4 -- Liquid Hydrocarbon Storage Well
Type 5 -- Gas Storage Well
Type 6 -- Other Injection Wells

County : KLEBERG RRC # 273

| Field (Reservoir) | RRC # | Well Type 1 | 2 | 3 | 4 | 5 | 6 | Total | No. Plug |
|---|---|---|---|---|---|---|---|---|---|
| BORREGOS (COMBINED ZONES) | 10730 | 13 | 4 | 26 | 0 | 0 | 0 | 43 | 31 |
| TIJERINA-CANALES-BLUCHER | 89945 | 13 | 0 | 3 | 0 | 0 | 0 | 16 | 6 |
| T.-C.-B. 21 (B-1) NORTH | 89945 | 3 | 4 | 3 | 0 | 0 | 0 | 10 | 5 |
| ALAZAN NORTH (ALL ZONES) | 1097 | 6 | 2 | 8 | 0 | 0 | 0 | 16 | 6 |
| SEELIGSON (COMBINED ZONES) | 82126 | 2 | 1 | 95 | 0 | 0 | 0 | 98 | 61 |
| 5 Fields (Reservoirs) | | 37 | 11 | 135 | 0 | 0 | 0 | 183 | 109 |

Texas Railroad Commission
Underground Injection Control Database
For Fields With 5 or More Active Wells of (Type 1 + 2 + 3)

Legend of Well Types
Type 1 -- Disposal Well (Non-Producing Zone)
Type 2 -- Disposal Well (Producing Zone)
Type 3 -- Secondary Recovery Injection Well
Type 4 -- Liquid Hydrocarbon Storage Well
Type 5 -- Gas Storage Well
Type 6 -- Other Injection Wells

County : MATAGORDA RRC # 321

| Field (Reservoir) | RRC # | Well Type 1 | 2 | 3 | 4 | 5 | 6 | Total | No. Plug |
|---|---|---|---|---|---|---|---|---|---|
| ANAHUAC | 2468 | 54 | 15 | 7 | 0 | 0 | 0 | 76 | 41 |
| MARKHAM N.-BAY CITY N (CAR | 57578 | 8 | 0 | 1 | 0 | 0 | 0 | 9 | 4 |
| MARKHAM | 57562 | 16 | 1 | 2 | 0 | 31 | 2 | 52 | 9 |
| OLD OCEAN (ARMSTRONG) | 67011 | 8 | 7 | 2 | 0 | 0 | 0 | 17 | 2 |
| OLD OCEAN (LARSEN) | 67011 | 0 | 0 | 14 | 0 | 0 | 0 | 14 | 3 |
| BLESSING (F-15) | 8871 | 0 | 1 | 19 | 0 | 0 | 0 | 20 | 10 |
| 6 Fields (Reservoirs) | | 86 | 24 | 45 | 0 | 31 | 2 | 188 | 69 |

Texas Railroad Commission
Underground Injection Control Database
For Fields With 5 or More Active Wells of (Type 1 + 2 + 3)

Legend of Well Types
Type 1 -- Disposal Well (Non-Producing Zone)
Type 2 -- Disposal Well (Producing Zone)
Type 3 -- Secondary Recovery Injection Well
Type 4 -- Liquid Hydrocarbon Storage Well
Type 5 -- Gas Storage Well
Type 6 -- Other Injection Wells

County : ORANGE RRC # 361

| Field (Reservoir) | RRC # | Well Type 1 | 2 | 3 | 4 | 5 | 6 | Total | No. Plug |
|---|---|---|---|---|---|---|---|---|---|
| ORANGE | 67484 | 3 | 3 | 1 | 0 | 0 | 0 | 7 | 0 |
| PORT NECHES | 72441 | 6 | 2 | 1 | 0 | 0 | 0 | 9 | 0 |
| PORT NECHES (MARG AREA 1) | 72441 | 0 | 0 | 8 | 0 | 0 | 0 | 8 | 0 |
| ROSE CITY NORTH | 78261 | 0 | 0 | 7 | 0 | 0 | 0 | 7 | 0 |
| ROSE CITY SOUTH | 78263 | 0 | 0 | 5 | 0 | 0 | 0 | 5 | 0 |
| MORGAN BLUFF (HACKBERRY) | 62868 | 1 | 0 | 6 | 0 | 0 | 0 | 7 | 0 |
| 6 Fields (Reservoirs) | | 10 | 5 | 28 | 0 | 0 | 0 | 43 | 0 |

Texas Railroad Commission
Underground Injection Control Database
For Fields With 5 or More Active Wells of (Type 1 + 2 + 3)

Legend of Well Types
Type 1 -- Disposal Well (Non-Producing Zone)
Type 2 -- Disposal Well (Producing Zone)
Type 3 -- Secondary Recovery Injection Well
Type 4 -- Liquid Hydrocarbon Storage Well
Type 5 -- Gas Storage Well
Type 6 -- Other Injection Wells

County : WHARTON RRC # 481

| Field (Reservoir) | RRC # | Well Type 1 | 2 | 3 | 4 | 5 | 6 | Total | No. Plug |
|---|---|---|---|---|---|---|---|---|---|
| MAGNET WITHERS | 56688 | 35 | 44 | 9 | 17 | 0 | 0 | 105 | 15 |
| PICKETT RIDGE | 71337 | 6 | 3 | 0 | 3 | 0 | 0 | 12 | 3 |
| PIERCE RANCH (4900) | 71451 | 3 | 1 | 1 | 4 | 0 | 0 | 9 | 0 |
| WITHERS NORTH | 98290 | 7 | 3 | 3 | 8 | 0 | 0 | 21 | 1 |
| WITHERS NORTH (-C- SAND) | 98290 | 0 | 3 | 7 | 5 | 0 | 0 | 15 | 2 |
| BOLING | 10229 | 15 | 5 | 1 | 0 | 0 | 4 | 25 | 9 |
| 6 Fields (Reservoirs) | | 66 | 59 | 21 | 37 | 0 | 4 | 187 | 30 |

Texas Railroad Commission
Underground Injection Control Database
For Fields With 5 or More Active Wells of (Type 1 + 2 + 3)

Legend of Well Types
- Type 1 -- Disposal Well (Non-Producing Zone)
- Type 2 -- Disposal Well (Producing Zone)
- Type 3 -- Secondary Recovery Injection Well
- Type 4 -- Liquid Hydrocarbon Storage Well
- Type 5 -- Gas Storage Well
- Type 6 -- Other Injection Wells

County : WILLACY RRC # 489

| Field (Reservoir) | RRC # | Well Type 1 | 2 | 3 | 4 | 5 | 6 | Total | No. Plug |
|---|---|---|---|---|---|---|---|---|---|
| WILLAMAR WEST | 97498 | 6 | 9 | 97 | 0 | 0 | 2 | 114 | 14 |
| WILLAMAR | 97491 | 8 | 1 | 2 | 0 | 0 | 0 | 11 | 3 |
| 2 Fields (Reservoirs) | | 14 | 10 | 99 | 0 | 0 | 2 | 125 | 17 |